SEP 24 1920

THE LANCET.

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

Telegrams—LANCET, WESTRAND LONDON *Telephone*—GERRARD 5356 *Offices*—423, Strand, London, W.C. 2.

No. XI. of Vol. II., 1920. LONDON, SATURDAY, SEPTEMBER 11, 1920. Pp. 112—Price 1s.
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Delivered before the Royal College of Physicians of London

BY SIR JOHN ROSE BRADFORD, K.C.M.G., C.B., M.D., F.R.S., F.R.C.P.

LECTURE I.

MR. PRESIDENT, FELLOWS OF THE COLLEGE, AND GENTLEMEN,—My first duty is to express to you, Mr. President, and to the College my sincere thanks for the honour conferred on me by the request to deliver these lectures to the College. In seeking for a subject suitable to the occasion it seemed that a short description of some of the clinical manifestations of disease such as I had the opportunity of observing whilst acting as a consulting physician to the British Expeditionary Force might be of interest. Such an account, however, as given now, must be very incomplete, and will, in fact, consist of little more than a record of some impressions, a survey of a more or less cursory character of the observation of very large numbers of cases of diseases of very different and varied nature. Further, it will deal more especially with disease from the standpoint of general medicine rather than with the special diseases directly related to the operations of war itself, such as trench fever and the effects of gas warfare.

VARIED OPPORTUNITIES FOR CLINICAL STUDY.

I propose, however, to discuss in one lecture some of the clinical phenomena seen as a result of gunshot wounds of the chest, the study of which revealed many interesting features. The field available for clinical study was enormous; the mere numbers concentrated in the larger hospital areas, where it was not unusual for some 20,000 or more beds to be occupied, alone afforded opportunities never, perhaps, available before. This mass of clinical material, thanks to the organisation of the Medical Services, the large number of skilled medical officers, and the equipment of the military hospitals, could be studied in a satisfactory manner, although naturally the exigencies of military service prevented in some instances the complete study of cases interesting only from the standpoint of medicine.

The field available for observation was not only large but also varied. In the earliest periods of the war the army consisted of a specially selected portion of the male population, inured to military service. Later, but still early in the war, the armies were formed of the finest specimens of the youth of this country, who, after undergoing a prolonged training, came out to France in magnificent health and in full vigour of body and mind. Later the periods of training were necessarily shortened, the age of the men increased, the standards somewhat relaxed, and towards the end of the war a certain proportion of the men were considerably younger and the standard of physique lower. These differences, however, were not those that made the opportunity of the physician so unique; this arose rather from the variety of race represented in the forces. From an early period of the war we had large numbers of soldiers from the Dominions—Canadians, Australians, New Zealanders—and a very short clinical experience often showed that these men reacted to disease in a manner different from that seen with our own home troops. Further, the Indian troops and those from the West Indies also afforded much food for thought, not so much from the point of view of the introduction of diseases more or less peculiar to or prevalent in these races, but rather from the point of view of the extraordinary differences in their reaction to the diseases prevalent in France and Flanders and affecting Europeans and those of European descent.

Thus the material available for clinical study provided by the actual fighting men was extraordinarily large and varied, but the field was really much greater than this, because in the latter stages of the conflict large numbers of men were enlisted for labour companies, and an army of women was also enrolled, in addition to the large number of women who had been engaged in nursing from the earliest stages of the war. When all these organisations were in full working order, as they were during the latter half of the war, the population that fed the hospitals was comparable to that of civil life, but with the very important qualification that it was still a selected population, both as regards age and as regards physique. The physician had the opportunity of studying the incidence of disease in a population where all diseases were, so to say, "notified," and not, as in civil life, where only certain diseases are so notified. This fact alone should provide ultimately much material of value for the study of disease, but naturally this subject is much too large to be dealt with here, and can only be adequately considered in the medical history of the war. Further, the experience of one individual, large as it was, is necessarily far too limited to deal with such an enormous and varied mass of material.

Although disease in war has usually claimed more victims than direct enemy action, and although military operations have often been hampered by the outbreak of disease, and especially of epidemic disease, yet the Great War was the only one in recent times where the military authorities made any special provision for physicians to accompany the armies in the field. Although from time to time in the past certain army medical officers in the field devoted themselves more especially to the problems connected with the sick, nevertheless the rôle of the doctor in the field was held to be that of an officer dealing especially with battle casualties. This is very natural when one considers the urgent nature of the medical, the military, and the humanitarian problem that presents itself during an engagement, whether it be part of an advance and attack, or the still more difficult question of dealing with the wounded when the military operations demand a retirement. The problem the military surgeon has to solve to the best of his ability is an urgent one, brooking no delay; the need is obvious and patent to all, even to those most ignorant of medicine. Failure to deal successfully with the wounded, either from the professional or the administrative side, is so obvious to all that it is not surprising that this side of the army medical officer's work has loomed large in the eye of the army, the medical profession, and the public, and it is right that it should do so, as it is work of the greatest importance from all points of view—military, professional, and humanitarian.

The rôle of the physician is different, but none the less also of value, both from the professional and military points of view. It is often said that his main function is the prevention of disease, although some would place prevention under the sole control of the sanitarian (who may or may not be a physician), and would seem to be under the impression that surgery and sanitation between them included all the problems likely to be met with by an army during military operations. Great as are the services rendered by the sanitarian, especially with an army in the field, the physician is still required, inasmuch as the prevention of the spread of disease requires not only the recognition or diagnosis of fully declared and typical instances of disease, but also the recognition of anomalous forms of common diseases. This is often a matter of some difficulty and one requiring considerable clinical experience and acumen and one of peculiar importance in military medicine, where the prevention of epidemic disease may well depend on the recognition of initial cases perhaps anomalous in their clinical manifestations. With this aid all the resources of the sanitarian can be brought to bear on the problem at once and early. The surgeon, the sanitarian, the bacteriologist, and the physician are all required in order to

deal adequately with medical problems on active service, and, further, they must work together and in harmony; no one of them can take on and perform satisfactorily the duties of the other; still less can any one of them deal with the whole problem. This was recognised only to some extent in the Army Medical Service prior to the war, encouragement was given to medical officers to specialise as surgeons, sanitarians, or bacteriologists, but it took several years of war for the real value of clinical medicine, as a subject of considerable importance for the maintenance of the efficiency of the fighting machine, to be recognised. Then steps were taken to place officers with special qualifications for the work in positions where their work could be effective.

The Surgical and the Medical Side.

The work of the army surgeon and of the army physician is in many respects very similar, and has the same general objects in view. Thus there is the humanitarian side, which concerns itself with attempting to provide the best possible treatment to the wounded and to the sick. Then there is the military side, which is more especially the problem of "wastage" and the best methods to adopt to check wastage and to bring the sick or wounded man back to duty as soon as possible. This question is of the first importance, both on the surgical and on the medical side, but it is a much bigger and more difficult question on the medical side, and it is here that the physician is of most value to the efficiency of the military machine. Surgery in the late war has done much to check undue wastage owing to the improvements effected in the treatment of wounds and the shortened stay of the wounded in hospital. This work was especially valuable inasmuch as wounded men, apart from their wounds, were in robust health, and thus provided the wound was soundly treated, could return to duty in a comparatively short time, especially in the case of the more slightly wounded. On the medical side the control of wastage was more difficult for several reasons. In the first place, the numbers dealt with were far larger, although this war, at any rate so far as concerns the campaign in France and Flanders, has been remarkable for the relatively small amount of disease, still the actual numbers of sick have been far larger than the number of wounded. Further, it must be remembered that the casualties from gas warfare were treated by physicians, although for statistical and other reasons they were included amongst the battle casualties and regarded as wounded.

Wastage.

These cases afforded many problems in connexion with the question of wastage, problems by no means simple in nature and requiring for their solution all the skill and experience of trained medical observers. Thus it may be said that not only was the number of cases very large on the medical side, but also that the question whether a man was fit to return to duty was very often a difficult one requiring much clinical experience for its solution. Wastage, however, arises quite apart from battle casualties, whether from wounds or the effects of gas warfare, or from nervous disorders, and in fact in all wars, including the late war, the main wastage is dependent upon disease and often on disease that might at first sight be thought of little interest or importance. Here the work of the physician is of especial value, as an extraordinary amount of wastage may ensue as a result of erroneous or incomplete diagnosis; disease of the skin and functional disorders of the heart afford illustrations of such conditions. Wastage on a very large scale may ensue as the result of the spread of epidemic disease. In some instances as, for example, in the outbreaks of true influenza in 1918, our present available methods of dealing with such problems only yield a very moderate measure of success. In other cases, such as the formidable diseases, cerebro-spinal fever and dysentery, much greater success is achieved, but in all cases success is largely dependent upon the recognition of early cases. The records of medicine, civil and military, old and recent, contain numberless instances of epidemics of disease where the initial cases were diagnosed erroneously. On the other hand, they also record instances where an acute clinical observer has recognised a malady in an unusual form, and prompt measures have led to the suppression of the threatened outbreak. In an army such questions are of the very first importance; much harm may result from initial cases of dysentery being regarded as diarrhœa, or of cerebro-spinal fever being thought to be that protean disorder, influenza. These are questions of clinical medicine, although for their complete solution the services of the bacteriologist are required. Much harm, however, may be done by placing undue emphasis on one or other of these two branches of knowledge, especially in an army in the field. Thus some would take the view that no diagnosis of dysentery is justified unless there is bacteriological proof of the presence in the excreta of the causative organism. This is, of course, the correct attitude to take in a contribution to the study of the disease, but it is not the correct view to take when dealing with a supposed outbreak of the disease in an army in the field. There the opinion of the clinician, formed summarily at the bedside and based on symptoms, should be sufficient for the case to be regarded and treated as dysentery, at any rate temporarily, pending further and more complete study. Doubtless, errors will be made, and some cases not dysenteric in nature will be regarded as such, but much less harm will be done than by refusing to regard a case as dysenteric until the organism has been isolated. Much dysentery, especially in armies, will always be regarded as mere diarrhœa, but all cases with blood and slime in the motions should unhesitatingly be labelled dysentery on clinical grounds alone. Epidemics of dysentery in armies are prone to develop considerably before being adequately and firmly treated, owing to the tendency to regard the early cases as mere diarrhœa, for a variety of reasons. Much may be done to minimise this danger if care is taken to segregate, whenever possible, cases of diarrhœa.

The control of wastage from dysentery is mainly a question of diagnosis and sanitation, but here, as in the cases of enteric fever and cerebro-spinal fever, there is also the vexed and very difficult question of "carriers"; and the frequency of relapse as a result of a return to normal food still further complicates the problem of wastage in the case of dysentery. All these questions demand for their solution much clinical experience, but a great deal can be done to check this wastage by accurate clinical diagnosis.

I propose, Sir, after these general introductory remarks, to pass on to the consideration of certain experiences that are not without interest. In one lecture, the third, I propose to deal with some of the clinical phenomena seen as a result of gunshot wounds of the chest; in my second lecture I hope to discuss certain diseases, such as nephritis and polyneuritis, from the clinical side; and, to-day, to deal more generally with certain impressions formed as a result of the survey of the clinical field as a whole and from the standpoint of general medicine rather than from that of the special pathological states induced as a direct result of active service.

ORGANIC HEART DISEASE.

In the first place, it may be said that, speaking broadly, the medical examinations made in this country prior to the men being sent overseas were successful in detecting gross organic disease, even in its many latent forms. This is shown by the fact that it was exceptional to meet with patients suffering from obvious organic diseases, such as diseases of the heart, although, as might be expected, a few cases of aortic regurgitation that had escaped detection were seen from time to time, and amongst the large numbers of cases of paroxysmal tachycardia that came under observation a few cases of mitral stenosis and some with auricular fibrillation were met with. One such case of auricular fibrillation was of considerable clinical interest, in that it illustrated a rare type with a group of symptoms only occasionally

seen, and these very liable to lead to difficulties in diagnosis owing to the simulation of an acute abdominal condition. The attacks of paroxysmal tachycardia seen in cases of auricular fibrillation may not only sometimes be very sudden in their onset, but may also be ushered in with severe abdominal pain instead of mere præcordial discomfort. This abdominal pain may be epigastric in position and accompanied with some local tenderness, together with some nausea and vomiting. The patient may be apparently very ill, with considerable collapse and much anxiety. In such a case an error of diagnosis may easily be made, if attention is concentrated on the abdominal pain and vomiting. The characteristic irregularity of the pulse may not be correctly interpreted, and the case may be regarded as an abdominal one and a perforation of the stomach or intestine diagnosed, the pulse being attributed to the effects of collapse, whereas in reality it is characteristic of the cardiac lesion present. I have seen two such cases—one, the case alluded to above, and one in civil practice prior to the war. In both laparotomy was performed under the mistaken diagnosis of perforation owing to the marked character of the abdominal symptoms and the apparent alarming condition of the patient; although in reality auricular fibrillation in association with mitral stenosis was the sole lesion present. In both cases the patient recovered. Mitral stenosis is not the only chest condition in which this error may be made; somewhat similar epigastric pain, together with collapse and some vomiting, closely simulating an acute abdominal lesion, may be seen, as is well known, in certain cases of angina pectoris, and also, strange as it may seem, in cases of sudden and extensive pulmonary embolism. In the latter instance the presence of urgent dyspnœa and of some degree of cyanosis should, however, be sufficient to prevent such an error of diagnosis.

Rarity of Cases of Acute Rheumatism.

Valvular disease of the heart was then an uncommon lesion, and this leads naturally to the consideration of one of the most interesting features of the medicine of the war—i.e., the rarity of the occurrence of acute rheumatism. Very few cases of this malady were seen, although such as did occur were of the classical type, and not uncommonly accompanied with pericarditis with effusion. When we consider that we were dealing with a population of an age suitable for this malady, and what the conditions were as regards exposure to cold, damp, and wet, to say nothing of fatigue, it is certainly noteworthy that the disease was as exceptional in its incidence as it proved to be. This fact would tend to support the views of those who hold that this disease is not specially associated with exposure to wet and damp. Further, it would seem that this experience in the recent war is similar to that recorded for the British Army in the Crimean campaign, where, notwithstanding the rigours of the climate, pericarditis of rheumatic origin was uncommon. The experience as to the incidence of acute rheumatism in this war is more especially interesting owing to the fact that this malady was equally uncommon amongst the large numbers of women employed by the army, although they also were of an age favourable to its occurrence. The very different incidence of acute rheumatism in the military hospitals in France from that familiar to us in civil hospitals in London was therefore very striking.

One case of acute rheumatism in a young nurse merits notice owing to the anomalous mode of onset and unusual clinical course of the malady. A nurse whilst on duty and not obviously ill was seized with symptoms of præcordial discomfort and slight faintness, and was found on examination to have slight pyrexia, the temperature being a little over 99° F. and a very slow pulse, both the pulse-rate and that of the heart being only 30 per minute. She was confined to bed, and the brachycardia and slight pyrexia persisted without the development of any other signs or symptoms beyond a faint systolic apical murmur that was not always audible. The pulse-rate gradually returned to the normal rate, and at the end of a week the temperature rose to between 101° and 102° F. and effusion occurred into many joints, the ankles, wrists, knees, and elbows, together with much pain, and the illness then followed the normal course of an attack of acute rheumatism, and the systolic apical murmur that had been heard occasionally and with difficulty in the earlier stages became now quite marked and obvious. The pulse increased considerably in rate, and the cardiac features of the case became much more pronounced in that there were considerable palpitation and tachycardia and the heart became enlarged, although there was never any evidence of pericarditis. On two separate occasions attacks of very severe tachycardia occurred, accompanied with extreme irregularity of the rhythm, and the pulse could not be counted owing to its frequency. These attacks were very severe and lasted several hours, and on one occasion the patient was in a critical condition for several hours. Recovery took place very slowly, and the patient was confined to bed for several months. Ultimately she recovered sufficiently to return to this country and some two years after the illness she was in good health, vigorous and able to return to work, presenting no abnormal physical signs except a faint apical systolic murmur with no signs of appreciable cardiac enlargement.

This patient would seem to have been an instance of one of those rare cases where the rheumatic virus affected primarily the myocardium, causing first brachycardia and subsequently extreme tachycardia probably due to auricular fibrillation, but certainly due to pathological changes in the auricular muscle. During the whole of my service in France no case of death from acute rheumatism came under my notice, nor did I see any case of rheumatic hyperpyrexia.

Infective Endocarditis.

A certain number of cases of infective or malignant endocarditis were, however, seen, although there were no reasons on clinical grounds for associating them with acute rheumatism; these cases presented both clinically and on post-mortem examination some features of interest. In view of the enormous number of septic wounds, especially during the first years of the war, it might have been expected on a priori grounds that infective endocarditis would have been of very frequent occurrence. The physician was not uncommonly asked to see cases where this complication of an infected wound was suspected to be present, owing to the presence of persistent and irregular pyrexia and the absence of any obvious cause for this in the state of the wound itself. It was, however, rare for signs to be present sufficient to justify such a diagnosis inasmuch as these cases usually presented only an irregular temperature and possibly a systolic murmur, signs, it is true, of a septic infection, but not characteristic of or limited to infective endocarditis. Post-mortem examination of large numbers of such cases showed the rarity of acute infective endocarditis as an early complication of infected wounds. Careful observation by a number of surgeons showed, on the other hand, that many of these cases were really of a different nature and dependent upon the wound infection causing thrombosis of, or even the presence of purulent clots in, the great veins of a limb, stump, or other part.

Whilst acute infective endocarditis was only rarely seen as a complication of septic gunshot wounds, quite a number of cases were seen where it arose primarily and in unwounded men. It is rather remarkable that in most of these cases the infection was a primary one, attacking healthy valves, and not superimposed on old valvular lesions. Some cases of the latter and more common variety in civil practice were, of course, seen, both clinically and in the post-mortem room; but the point I wish to draw attention to is that an appreciable number of cases of primary acute infective endocarditis of the well-known type occurred in unwounded men with cardiac valves showing no signs of previous disease and where the source of the infection was not discovered. No septic focus was found in such cases, and they were not the sequel of pneumonia. Further, so far as my experience went, such cases were more frequent than cases following as a result of a septic wound, and they not uncommonly ran an acute and rapid course clinically.

Cerebro-spinal Fever.

Cerebro-spinal fever is a malady of great clinical interest and of considerable military importance, and it is a disease that presents several problems still awaiting solution. The earliest cases in the British

Expeditionary Force were seen in the late autumn of 1914, and it may be of some interest that in the very first batch of cases seen there were some that presented anomalous features, not only in their initial symptoms and mode of onset, but also in their clinical course and in the nature of the cerebro-spinal fluid.

Anomalous Cases.

Anomalous cases presenting similar features were seen from time to time throughout the campaign in association with other cases presenting the more classical and well-known symptoms of the disease, and it is to a certain group of such cases that I desire to direct your attention. This group of cases presented a distinct and fairly uniform picture of a malady with a sudden onset, with fever, headache, and vomiting, together with pains in the limbs of varying severity.

The patient rapidly passed into a condition of apparently considerable gravity with partial unconsciousness, or in the less severe cases into a stuporose condition with imperfect realisation of his surroundings. In all cases there was quite definite and marked retraction of the head, and the pulse-rate was usually slow. These cases always resembled closely cases of undoubted cerebro-spinal fever of a moderately severe type, and the more severe forms with a very sudden onset were practically indistinguishable clinically from cases of cerebro-spinal fever. One point that always made a positive diagnosis of cerebro-spinal fever a little doubtful in such cases was that Kernig's sign was not usually of the absolutely definite character—that is, associated with cerebro-spinal fever. In other words, the fixity or the rigidity of the knee was of a more plastic character and not of the locking character associated with cerebro-spinal fever. Nevertheless, the physical signs, including Kernig's sign, the initial symptoms, and the severe illness were all often so closely similar to those of true cerebro-spinal fever, that an accurate diagnosis was impossible in many cases without lumbar puncture. Lumbar puncture in these cases always yielded the same result. There was a considerable increase in the amount of cerebro-spinal fluid obtainable on puncture, and the fluid was under great pressure, but the fluid not only showed no abnormal cell elements, and no organisms were obtained on culture, but it was always extraordinarily clear and limpid in character. The quantity obtained was always large and sometimes very large, as much as 100 c.cm. being withdrawn at a single operation. The lumbar puncture was followed by rapid improvement and subsidence of the symptoms, and in most cases convalescence ensued rapidly and immediately. In some few instances the lumbar puncture had to be repeated, but this was quite exceptional, and in all the cases seen—some 20 in all—recovery was complete and usually rapid, no case being fatal. In a few cases, and notably in one that occurred in a medical officer, there was, in addition, a painful rash. This rash was present in the trunk, arms, and thighs, and consisted of small raised red papules tender on pressure; the tenderness on pressure was such as to cause considerable discomfort to the patient.

These cases formed a very definite clinical group, and their true nature is very obscure; it is difficult to determine whether they should be regarded as a variety of cerebro-spinal fever, or as mere so-called meningismus associated with a variety of diseases, or as an independent affection. The uniformity of the clinical phenomena and of the course of the affection, together with the absence of any evidence of the presence of other diseases in the patients, makes it very improbable that the cases were of the nature of meningismus complicating some other disease. The workers on cerebro-spinal fever in this country have described cases where no organisms were found in the cerebro-spinal fluid and where this fluid was clear; but whether these cases were of the same type as those just described is not quite certain, although it is probable. Our cases were characterised by an extraordinary limpidity of the fluid, together with a notable excess in quantity and sometimes, as mentioned above, a very great excess. Further, in the cases described in England the meningococcus, although not found in the cerebro-spinal fluid, was found in nasal swabs; but this was not the case in a series of these cases examined in France, as the meningococcus was not found in throat and nasal swabs in a single case of this type. The fact that these cases occurred at the same time as other typical cases of cerebro-spinal fever is, of course, a strong argument for linking them together. The clinical point I wish to emphasise is that these anomalous cases were often of a quite severe type with marked, and in some cases with urgent, symptoms, and that they were not by any means cases presenting only slight and equivocal signs or symptoms of cerebro-spinal fever; nevertheless, they were never fatal. Every clinician is familiar, especially during an epidemic of cerebro-spinal fever, with cases where the symptoms are suggestive of the presence of the disease, although they are not of a severe type, and where the results of puncture are negative and the patient rapidly recovers. The cases I have attempted to describe are not of this type, since they are often of a severe character, and during the first 24 or 48 hours of illness almost indistinguishable from cases of severe cerebro-spinal fever. I fear I am only able to give this short description of them and am not able to state positively their nature, although they seem to form a definite clinical group.

Difficulties in Diagnosis.

Cerebro-spinal fever sometimes presents peculiar and remarkable symptoms at its onset, and thus renders early diagnosis difficult. One of the most frequent of these anomalous types of onset is that in which dyspnœa is the leading symptom, and where other symptoms, such as headache and fever, although present, do not attract attention as they are comparatively slight; whereas the dyspnœa may be very marked and urgent. In some instances the dyspnœa is of sudden or, at any rate, of rapid origin and may be severe enough to cause the patient to sit up in bed. It is apt to be accompanied with some restlessness and probably some mental dullness and confusion. If due importance be not given to the presence of slight pyrexia such cases are very apt to be diagnosed as uræmic or even, as I have seen, as diabetic in origin, owing to the presence in the urine either of albumin or of some reducing substance. Several cases of cerebro-spinal fever of a very severe type and rapidly fatal have fallen under my observation where uræmia had been diagnosed on account of the severity of dyspnœa and the presence of mental dullness or stupor. In some cases the rash of the disease had been regarded as confirmation of the existence of uræmia. In all these cases the error was dependent upon the presence of albuminuria being regarded as proof of the existence of serious renal disease. In these cases with marked dyspnœa the dyspnœa is always very urgent and not infrequently it is a very early symptom. Such cases, so far as my experience goes, are very severe and usually rapidly fatal. There is no real difficulty in the diagnosis, as a complete examination of the patient reveals physical signs characteristic of the disease and lumbar puncture at once yields positive evidence. Cerebro-spinal fever may not only be confounded with uræmia, but it may also be confused with nephritis. The former mistake is merely an error in diagnosis and in the interpretation of certain signs and symptoms; but the confusion with nephritis is a more difficult problem, as it would seem that certain cases of cerebro-spinal fever may not only develop nephritis as a complication, but that in other cases for a certain period nephritis may be the only manifestation of the disease. Several instances of the association of nephritis with cerebro-spinal fever were seen, and in some the onset and cause of the illness was very remarkable. In the first place, nephritis may occur as a complication in ordinary cases of cerebro-spinal fever of moderate severity and running a normal course with the usual signs of declared and obvious meningitis. In such cases nephritis is also of the familiar type with or without anasarca. In 1915 I saw two such cases in adjoining beds with the late Dr. Carter, of Birmingham; in both the cerebro-spinal fever was of a severe type, and in the second week of illness the nephritis developed and was accompanied with very considerable anasarca. In such cases, however, both the meningitis and the nephritis are quite typical, and it is only that one occurs as a complication of the other. It is not this type of case that leads to error of diagnosis, but another type which is of greater clinical interest, and where the

initial manifestations of illness take the form of nephritis. The meningeal symptoms are at first absent, and only develop after the lapse of a week, ten days, or possibly even longer.

In these cases the onset of the disease is subacute, with headache, general pains, but not of great severity, possibly some initial vomiting and slight pyrexia. There is no sign of severe illness and no signs or symptoms suggestive of the presence of meningitis. The urine contains an appreciable, or it may be a considerable, quantity of albumin, together with epithelial and granular casts. Thus the diagnosis of nephritis is made and the patient's condition attributed solely to this. I have not seen anasarca in any such case, although it certainly may occur in the nephritis that develops as a complication in declared cases of cerebro-spinal fever. The patient with the supposed simple nephritis is not apparently very ill, but is apt to be very quiet and apathetic, and the headache and slight pyrexia persist. The headache becomes more intense, and then, after a variable period, sometimes a few days, in others longer, and in one case after three weeks, symptoms such as very intense headache, stiffness of the neck and possibly of the limbs become much more marked and reveal the true nature of the disease, and this is confirmed at once by lumbar puncture. Although the meningeal symptoms develop and increase, the nephritis does not, the renal lesion would seem to be always of very moderate intensity, and certainly not rapidly progressive. Several instances of this "nephritic" variety of cerebro-spinal fever came under my notice, and some were fatal, including one in a nurse.

Two other anomalous modes of onset in cerebro-spinal fever may be described shortly, although they are both rare.

In one the onset of the disease was very sudden with severe and repeated diarrhœa, accompanied with some abdominal pain and headache not of a severe character. The diarrhœa was profuse, and its sudden onset, with the fact that there were no other marked symptoms, led to the suspicion of some food poisoning being its cause. The diarrhœa lasted some 12 hours, and the next day the patient, a medical officer who had been in contact with cases of cerebro-spinal fever, expressed himself as having recovered from the attack; but he looked ill and had some headache and considerable albuminuria; the diarrhœa, however, had ceased, and only very slight pyrexia, the temperature being just over 99° F., was present. No signs of cerebro-spinal fever were observed although looked for, as the disease was rather prevalent at the time. During the next two or three days no symptoms developed beyond the fact that in the afternoon the headache became more marked and the temperature rose to 100°, and the patient began to complain of aching and stiffness in his limbs; these symptoms were absent in the morning. On the sixth day of illness the headache became more intense and lumbar puncture revealed the true nature of the disease, and the case was fatal at the end of another week.

A Remarkable Case.

The most remarkable case from the clinical standpoint of this disease seen by me was one where an officer had a febrile illness of some five weeks' duration with absolutely no signs of any kind beyond the presence of the pyrexia.

The fever was very high, reaching 105° F. on several occasions, and there was always a large daily oscillation so that the chart greatly resembled some septic infection. He had very few symptoms and for a considerable time did not apparently suffer from the pyrexia. I often saw him sitting up in bed reading, writing, &c. All the usual examinations, including repeated blood cultures, yielded negative results, and during all these weeks of fever no diagnosis was made. After some five weeks of pyrexia of this septic type he suddenly developed rigidity of the neck, accompanied with severe headache and vomiting, and lumbar puncture revealed the presence of meningitis, and the organism was recovered and successfully grown. After a very prolonged illness of a severe type and necessitating several lumbar punctures he ultimately recovered completely and served in the Air Force at the front. I have seen him recently, when he was in vigorous health and actively engaged in work.

In bringing to your notice these anomalous forms of cerebro-spinal fever I have purposely excluded the considerable number of cases where failure to recognise the malady depended only on the mere confusion of meningitis with such well-known diseases as rheumatism or influenza—in other words, mere errors of diagnosis made when confronted with the ordinary forms of meningitis, and when the apparent slightness of the symptoms failed to warn the observer that they were really dependent upon such a serious cause as cerebro-spinal fever.

Ætiological Significance of Anomalous Cases.

The study of these anomalous cases is of some interest in relation to the problem of the ætiology of the disease, and would seem to confirm the idea that the danger of direct infection from cases of the malady itself to others is not really very great. The anomalous cases I have described were necessarily not recognised in their early stages in many instances, and during this period they were often in general wards with no special precautions; yet the disease did not spread to others, even when, as in some cases, their stay in such wards was prolonged to several weeks. Thus, in some of the cases with an onset simulating nephritis a patient might be in a general ward for as long as two or three weeks, yet I am not aware of the disease having spread to others in any such case. This is in harmony with the rarity of the infection spreading from declared cases to others in close contact with the sick—e.g., medical officers and nurses. Although the direct spread of infection from the anomalous cases was not observed, nevertheless it is possible that such cases may lead to the development of the disease indirectly in the same way as the more usual types of the malady, and therefore their prompt recognition and isolation is equally important in all circumstances and more especially perhaps in military medicine.

TUBERCULOSIS.

The existence of large hospital camps afforded an opportunity for obtaining some statistics as to the incidence of tuberculous lesions both active and quiescent, owing to the performance of post-mortem examinations in the thorough and complete manner that is customary as a routine in civil hospitals, and it was possible for this to be done in these hospital camps, thanks to the centralisation of such work under the superintendence of a specially appointed medical officer with experience as a pathologist. The full and complete results of this work will doubtless be published later, and I only wish now to allude to certain facts of interest. I am indebted to the courtesy of Dr. T. H. G. Shore, who was the officer in charge of the morbid anatomy in the Etaples area, for some statistics that are of interest. Clinical observation in the hospitals showed that tuberculosis was not a very common ailment, but the large number of men dying from wounds after severe fighting, gave an opportunity probably never before obtainable, of getting reliable information as to the frequency of the presence of tuberculous lesions in the apparently healthy. The detailed study of the autopsy statistics of the war and especially those from large hospital centres where the morbid anatomy work was organised, will give valuable information on this and on other questions, but such studies are necessarily at present incomplete. The statistics I am now going to put before you are merely those of the incidence of tuberculous lesions as proved by post-mortem examination, in cases of death from all causes, including therefore deaths from wounds, accident, disease, and disease includes cases of death from tuberculosis. In other words, it records the incidence of tuberculous lesions as determined by post-mortem examination in the British Expeditionary Force. These observations were carried out during the later years of the war——i.e., in 1917 and 1918—that is to say, at a time when the personnel of the armies was perhaps not quite of the same standard as in 1914 with the old Regular army, or in 1915 with the original Territorial army and the original so-called Kitchener armies. Nevertheless, the army population of 1917 and 1918 was still a selected population, both as regards age and physique, and was not comparable to the mixed population from which a London hospital derives its patients.

Statistics of Tuberculous Lesions Post Mortem.

The total number of post-mortems performed was 2121, and in 256 cases a tuberculous lesion of some kind was present—that is to say, in 12 per cent. of the cases. In the 256 cases 62 cases are included where death was the direct result of the tuberculosis; in other words, there were 62

cases of fatal tuberculous disease amongst the 2121 post-mortem examinations made in deaths from all causes. Thus, although the total incidence of tuberculous lesions was some 12 per cent. of the total post-mortem examinations made, tuberculous lesions were present in men dying from wounds or from some acute disease other than tuberculosis in about 9 per cent. of the total number of cases examined post mortem. Dr. Shore has analysed these figures to some extent, and his results show that the actual incidence of tuberculosis is much the same in the British, Canadian, and Australian Forces. In these three separate forces the incidence varies only between 11·4 per cent. and 11·8 per cent. In the New Zealanders the incidence was much higher—i.e., 17·8 per cent.—but the number of cases examined was small—i.e., only 56 post-mortem examinations were made in New Zealanders, with 10 cases where tuberculous lesions were present, so that it would be unwise to draw any definite conclusion from so limited a number. In a series of 1513 post-mortem examinations yielding 146 cases with tuberculous lesions the situation of the lesion was as follows:—Pulmonary, 113; glandular, 74; miliary, 14; peritoneal, 14; renal, 20. Expressed in percentages: Pulmonary, 76·7 per cent.; glandular, 50·7 per cent.; miliary, 9·6 per cent.; peritoneal, 9·6 per cent.; renal, 13·7 per cent. If these are expressed as percentages of the total number of post-mortem examinations in the series the following are the results:—Pulmonary, 7·5 per cent.; glandular, 4·9 per cent.; miliary, 0·9 per cent.; peritoneal, 0·9 per cent.; and renal, 1·3 per cent. In the series of 1513 post-mortems there were, as mentioned above, 113 cases in which the tuberculous lesion was pulmonary. If these pulmonary cases are further analysed the following results are obtained:—In 27 cases (i.e., 23·9 per cent.) the lesion was active; in 21 cases (i.e., 18·6 per cent.) the lesion was chronic; and in 65 cases (i.e., 57·5 per cent.) the lesion was quiescent. In the 74 cases of glandular tuberculosis it is perhaps worth recording that 34 were thoracic, 32 abdominal, and in 8 cases both sets of glands were involved.

These statistics not only give results as to the incidence of tuberculous lesions in the army, but they may perhaps also be used, doubtless with many qualifications, to throw light on more abstruse questions, as, for instance, the different degrees of resistance of different races to the virus of tubercle. Dr. Shore has classified the results according to race; thus a small number of post-mortem examinations were made on natives of South Africa, of the West Indies, and of New Zealand Maoris. The numbers are small, but the incidence of tuberculosis was high; but although this is of interest, the most striking fact was that in all cases where tuberculous lesions were present the patient had died from tuberculosis, and no instance of either a chronic or a quiescent lesion was found on post-mortem examination of these native races. Further, in the white races the death-rate from tuberculosis presented considerable differences.

Thus although the percentage incidence of tuberculous lesions in the British Canadians and Australians was much the same, varying, as stated above, from 11·4 per cent. to 11·8 per cent., the death-rates in these different forces were very different. In the British, in a series of 1650 post-mortem examinations, there were 188 presenting tuberculous lesions, and in 31 these were the cause of death—i.e., the death-rate was 16·5 per cent. of those affected. In the Canadians the corresponding figures were: post-mortems 220, tuberculous lesions 26, deaths from tuberculosis 7, a percentage, therefore, of 26·9. In the Australians: post-mortems 93, tuberculous lesions 11, deaths 5—i.e., a percentage of 45·4. The figures for the New Zealanders are very small: post-mortems 56, tuberculous lesions 10, and deaths 8—i.e., a percentage of 80.

Thus the resistance of the men in the British Forces would seem to have been the greatest, and that of the natives of South Africa, West Indies, and Maoris the lowest, and that of the men coming from the Dominions intermediate between these two extremes. It would seem, however, that they also presented differences amongst themselves—e.g., the Canadians and the Australians.

DISEASES OF THE BLOOD.

A few cases of pernicious anæmia were seen, but the number was very small; on the other hand, an appreciable number of cases of leukæmia occurred, and there are certain points of interest with reference to these cases. Thus only one case of the more common form of the disease—i.e., chronic spleno-medullary leukæmia—was seen; all the others were instances of acute leukæmia of more or less sudden onset and rapidly fatal after an illness of only a few weeks, and often of only two or three weeks.

These cases were of a very uniform type, characterised by moderate fever, great weakness and prostration, often of sudden and always of rapid development, with an intense and very characteristic pallor, and generally some purpura. In some cases the occurrence of purpura was the first sign to attract attention, but more usually it was found on examination in a patient who reported sick owing to rapid prostration and loss of strength. The purpura was usually moderate in degree, but not infrequently it was of the type of purpura hæmorrhagica, and hæmaturia, sometimes profuse, and epistaxis were the most common forms. Hæmorrhage from the bowel also occurred. The purpuric eruption in the skin was of the usual type, but I was struck with the frequency of the presence of purpuric spots in the face, a phenomenon that is usually regarded as very exceptional. Purpuric hæmorrhages in the gums and in the tongue were also not uncommon, and some of the cases suffered from the severe stomatitis and sloughing of the gums that is such a well-known feature of the disease. All the cases showed the well-known and characteristic changes in the blood, such as the very great diminution in the number of the polymorphonuclear cells and the enormous increase in the number of large transitional lymphocytes with a large nucleus. I saw no case of acute leukæmia where the increase and number of white cells was due to an increase affecting only or mainly the small lymphocytes. The glandular enlargement was usually moderate and never extreme, and clinically the spleen was either not enlarged or only to a moderate degree. On post-mortem examination the thymus was in all cases persistent and enlarged.

It is of interest that so far as my experience went acute leukæmia, and especially that form of it characterised by purpura, was seen much more frequently than the ordinary forms of leukæmia.

An Obscure and Rare Disease.

In relation to this blood disease mention may be made here of an obscure and rare disease that was seen in two and possibly in three instances.

This malady was characterised by a febrile illness, somewhat resembling in its gradual onset and clinical course enteric fever. This similarity was shown not only by the gradual onset and the character of the temperature chart, but also by the occurrence at the onset and in the first few days of illness of some diarrhœa. The pyrexia was considerable, reaching 103° F. in its daily oscillations. The pyrexia lasted several weeks, during which the spleen slowly and gradually increased in size, and in at least two cases not only reached the middle line of the abdomen but passed well beyond it. The splenic enlargement was quite comparable to that seen in ordinary cases of spleno-medullary leukæmia. The patient presented no marked symptoms beyond those due to the pyrexia and a moderate degree of anæmia. Blood examination revealed a condition similar to that seen in splenic anæmia, a diminution in the number of red cells, and a considerable leucopenia, the white count falling to 3000. Repeated examination of the blood and stools failed to detect any organisms of the enteric group, and the Widal reaction was also uniformly negative.

The cases presented considerable resemblances to those of splenic anæmia, pyrexia, great splenic enlargement, anæmia, and leucopenia, but this diagnosis can scarcely be correct, since after an illness of many weeks the pyrexia declined and the spleen slowly returned to its normal size. One such case was not only watched throughout the illness, but it was ascertained that he was quite well one year after leaving hospital. The nature of these cases is obscure, as it would seem that enteric fever, splenic anæmia, and certain tropical affections could all be excluded, as not only was the search for parasites negative, but the cases were seen in young soldiers who had only served in France.

SALARIES OF SCHOOL MEDICAL OFFICERS.—At the last meeting of the Devon Education Committee it was decided to appoint a subcommittee to consider the question of the salaries of the medical staff. The Devon Education Committee some time ago decided to give their medical officers £410 per annum, but owing to resignations they have had to give a locum tenens 10 guineas a week, or £520 a year. The chairman said that they could not get medical officers for £400 per annum, and another member remarked that the salaries would have to be increased. Eventually the subcommittee was appointed, and it appears that the Education Committee will in the future have to pay the usual salaries given to school medical officers.

HOSPITAL TREATMENT OF THE PSYCHOSES AND PSYCHONEUROSES.

SUGGESTIONS FOR BRINGING THEM WITHIN THE SCOPE OF A GENERAL SCHEME.

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THE following suggestions are concerned particularly with patients other than in the metropolis who are either of the usual hospital class or not able to pay more than from two to five guineas a week, most of them only able to pay such fees for about six months. Under the designation "psychoses" would be comprised the various varieties of mental disorder, mainly in an early phase. The psychoneuroses would be illustrated by the borderland states, with mixed mental and "nervous" manifestations; psychasthenia or neurasthenia, with obsessions or imperative ideas; morbid doubts and fears; tics, with psychical perversion; psychoses associated with disorders such as Graves's disease or chorea; mixed nervous and psychical disorders after mental or physical shock; psychoses associated with minor epilepsy. All these conditions are accompanied by physical reduction, more or less in degree. Those interested in neurology (with which these suggestions are not concerned) may consider that its claims to be dealt with under a general scheme require to be pressed.

The medical requirements of cases of the psychoses and psychoneuroses have never been adequately met in this country. The time would seem opportune, I would fain say propitious, for insistence and persistence on their behalf. Greatly daring I shall scarcely be if I maintain that these patients constitute the most neglected section of the sick community. How could they be comprised in such a scheme as has been sketched in the Interim Report of the Consultative Council on Medical and Allied Services? In view of the stepmotherly treatment which has been meted out to patients suffering from these maladies hitherto, those whose practice lies amongst them have, no doubt, perused the Report, and especially with a view to ascertaining whether their claims to benefit under the projected scheme have been adequately dealt with. On consulting the Report it will be seen that the only reference made to mental disease is under "Supplementary Services" (pars. 14 and 74). Amongst these services come "hospitals for curable or incurable mental disease." So that the patients now referred to would merely be provided for in a supplementary fashion, together with, for instance, cases of tuberculosis, of infectious disease, and of epilepsy suitable for colony care. Incurable mental disease could be adequately provided for thus, but not curable. The psychoses and psychoneuroses together constitute a vast and oppressive liability, which, I maintain, cannot be discharged through the medium of a mere supplementary service. They were long since shunted on to the sidings of the main traffic of disease, where they have remained, mainly stationary. They, with their medical and nursing services, have long suffered, and still suffer, all the evils of segregation. What is now suggested amounts to a perpetuation of these evils in a milder form. Being at present outside medical society, it is proposed to admit them to its fringe. I would claim, with the full blatancy of the most truculent of trade-union leaders, "full recognition" for them; full provision, alike in primary, secondary, and teaching centres. I affirm that no adequate reason against their inclusion in any way worthy to be set against their crying needs can be adduced.

Application of the Three-centre Scheme.

One may conceive cases of the psychoses and psychoneuroses as occurring in a certain area, and provision being made for them under the general scheme of the Interim Report as follows (existing buildings, modified or enlarged, to be used for the present; the psychiatric clinic would require to be a new building):—

(*a*) In a rural district, where the most modest requirements of an indoor clinic or hospital are scarcely available and the needs of patients would have to be met under the next heading.

(*b*) In a small town able to furnish a building worthy to rank as a hospital (primary centre). Here there would be comparatively modest equipment for diagnosis, clinical laboratory work, and medical and surgical treatment.

(*c*) In a large town containing a hospital in an adequate sense, with visiting medical staff, some with training in special directions; a resident medical officer or two; some of the nurses specially trained in various directions, with one or two capable of conducting, with some tuition, a class of Swedish exercises; with masseuses; with laboratory facilities of a fairly extensive kind and technical apparatus; with out-patient department—in fact, a hospital equipped with everything entitling it to rank as a secondary centre.

(*d*) In the town wherein is situated a medical school, with its associated hospital, research and laboratory workers, teaching facilities, and consultants; the teaching or tertiary centre, to wit; the *ne plus ultra* when the lacking clinic in psychiatry, complete internally, with its out-patient department in association with other like departments of the hospital, shall have been established.

Those who have experience, be they general practitioners or specialists, of the difficulty and inappropriateness of dealing with—I will not say treating—these patients in their homes will fully appreciate how much the application of the three-centre scheme will mean to them. In my judgment, the first desideratum is to get them away from home surroundings and from relatives. Is there any class of invalid to whom this applies with equal force? Solve this difficulty by providing for these cases on the three-centre system, and their treatment is at once placed on a sound footing, and the haunting fear of the alternative to home—the asylum—will fade, treatment will commence in reasonable time, and less will be heard of the need for extending asylums. In making such provision, regard must be had to special requirements. Whether cases of the psychoses and psychoneuroses are received under (*b*), (*c*), or (*d*) of the above scheme, they will require facilities under the following headings:—

A room or ward so arranged, supervised, and administered, that means of self-injury are reduced to a minimum; one or more single rooms for isolation; a nurse or nurses, trained in mental disorders (preferably with general training also; the combination is more and more to be found); one or more masseuses, according to requirements; facilities for open-air rest in bed, for regular weighing; douches, open baths, available for prolonged warm-bath treatment—under (*d*) baths maintaining a constant level and temperature; a garden for exercise and occupation; facilities for indoor occupation, especially handicrafts—under (*d*) suitable shops, sewing-room and gymnasium, and other facilities for treatment under this special heading, which need not be specified here.

As regards *diagnosis and medical advice*, the principal and second medical officers of the nearest public mental hospital should be available for consultation, as also the director, or one of the staff, of the nearest psychiatric clinic. I would suggest that the domain of the psychoses and psychoneuroses is quite peculiarly one in which the general practitioner finds himself, and will continue to find himself, in need of expert advice, and that he will not commonly take the sole responsibility of deciding how the patient should be disposed of. I think a special case can be made out for an arrangement under the general scheme, with the agreement of the controlling authorities of mental hospitals and psychiatric clinics, whereby a reasonable fee is payable to the staff of these institutions for this consultative work out of local or State funds, in cases where the patient has no means. In suitable cases, and where distance allows, the patient can be sent by his doctor to the out-patient department of the nearest psychiatric clinic, or of the nearest mental hospital, should such department exist at the latter, and advice as to his disposal be thus obtained. However obtained, expert advice could decide whether the patient should be dealt with in hospital under (*b*), (*c*), or (*d*); whether—exceptionally—by reason of the gravity of his symptoms, notwithstanding their recent origin, or of insufficient accommodation being available under (*d*), the case should go to a mental hospital. When the case falls to be treated under (*b*), his own doctor should look after him, whenever possible, expert advice being available. Under (*c*) the patient will be under the care of a member of the visiting staff. Expert advice in this instance will, for a time, only be available from the mental hospital and psychiatric clinic, the senior staff being placed

on the visiting staff of the hospital. But these clinics will in time furnish specialists for the large towns, who will be on the staffs of the hospitals with psychiatric wards. The consulting work of the district would be done by the director of the clinic and by these specialists. As consulting work is an essential part of the recommendations of the Interim Report the need for clinics in psychiatry, in this instance for the training of consultants, is once more emphasised.

It is highly desirable that patients who are convalescent from the maladies here dealt with—and no doubt the same is true of most diseases—should not return direct to their homes, but through a convalescent home or sanatorium. Recuperative centres are, I observe, recommended (para. 74) in the Interim Report.

Illustrative Cases.

The following brief descriptions of patients dealt with by me at the newly established out-patient clinic in psychiatry of King Edward VII. Hospital, Cardiff, within the last two months may afford examples of cases susceptible of care and treatment on the lines indicated. It will be observed that all should have sought advice much earlier. The provision of rational facilities for care and treatment should go far to remedy this drawback.

Cases 1 to 6 could be treated under heading B or C of the above scheme.

CASE 1.—A. B., male, aged 25, single; commercial traveller. Mother had epilepsy. Five years ago attack of "religious mania" and in the county asylum for three months; remained well till two years ago, when he became "altered," but was able to go on working; present condition dates back three months; at present shows some exaltation; writes lengthy letters to distinguished people; believes himself to be a person of some importance; tends to restlessness; is forgetful, and unable to apply himself; quarrels with his employers; there is evidently general physical reduction. Is a candidate for an attack of mania unless promptly cared for. At present can only be treated at home.

CASE 2.—C. D., female, aged 20, single; domestic servant. No noteworthy history of mental or allied disorders in family. About three years ago, whilst in a situation, was taken advantage of by her employer. Had a child in consequence (two and a quarter years ago); went "strange" and has been "strange" since. About 18 months ago said to have had what appear to have been choreiform tremors in the left limbs. Mother states that the girl tried to strangle herself three weeks ago; also took some poison; said to be impulsive and vicious. At the present time tremors in all limbs, more marked in the left hand; probably most of the tremor removable by psychotherapy. Considerable physical reduction, morbid doubts and fears, with associated depression, and a considerable neurotic element. Patient very desirous of being admitted to a hospital; begged not to be sent home; recognised she was a burden to her mother, who had already sent her once to a union infirmary, for lack of a more suitable place. At present can only be treated at home.

CASE 3.—E. F., male, aged 25, single; coal-tipper. No noteworthy history of mental or allied disorders in family. Well and able to earn his living until June, 1919, when he met with a severe accident, sustaining compound fracture of the femur; the mental condition is referred back to this. Father states that patient was normal during puberty and adolescence, although rather backward at school; has left club-foot.

Present condition dates since last Christmas; gradually became depressed, crying for a trifle; morbid anxiety and fear; lack of energy; restarted work ten weeks ago, but unable to continue; thinking people staring at him, that he was of "no use"; afraid to see others; talking to himself; sleeping irregularly, and capricious re food. Physically much reduced; marked tremors of tongue and of facial muscles when speaking. Wassermann in serum negative. Present mental condition is one of partial dementia.

There happened to be a hospital in his district, and it was recommended that he be taken in there and treated by his medical man, who referred the case to the out-patient clinic, with occasional reference to me, although the facilities available at the hospital are not all that could be wished.

CASE 4.—G. H., male, aged 40, married; engine-driver. No noteworthy history of mental or allied disorders in family; states that he has had slight attacks of nervousness and "lowness" the past four or five years at different times, but he has never had to leave work. Present condition dates to about six months ago, and is ascribed by the doctor to influenza followed by a rather severe attack of pneumonia; more or less since then has complained of inability to attend to work, to take responsibility; inability to remember; feelings of depression, with loss of interest in work; sleep and appetite have been failing.

The present state may be described as psychasthenia; he complains of various morbid sensations in various parts of his body, and these can be suggested to him; is in a state of doubt and anxiety; says that everything is "closing in"; is entirely introspective; believes that his condition is traceable to masturbation in youth; says he would sooner be dead if his condition is incurable. Physically considerably reduced.

There being a hospital in his district (with the same limitations) the same recommendation was made as in Case 3.

CASE 5.—J. K., female, aged 20, single. Occupation nil. Family history: Mother states she has had five miscarriages (from six weeks to six months); no evidence of syphilis; one brother, aged 22, of the patient had a "nervous breakdown," for which he was discharged from the army; one brother (? the same), had night terrors; otherwise no noteworthy history of mental or allied disorders in family; mother observed to have malformed incisors of upper jaw, the teeth projecting to a marked degree. Patient described as having been late in learning to walk, but not in any other respect; also had night terrors earlier in life. Menstruation commenced at the age of 12; the present condition is worse at the menstrual periods. This attack (the first) is traced to overwork or mental strain in a clerical office, together with an attack of influenza. In August, 1918, matters came to a climax; it was noticed that she was unable to do her work; the present condition has lasted, off and on, since then. The hard palate is decidedly narrow and vaulted. The anterior nares are extremely narrow, the left is almost occluded; patient very pale and looks reduced; the mother states she has lost weight.

The present condition is one of marked confusion and disorientation; her conversation is jerky and inconsequent, at times almost incoherent; she is restless and fidgety; unable to fix attention; occasionally laughs and mutters to herself; at times is impulsive, and has thrown articles whilst at the dinner-table. (The condition is not one of dementia præcox.) She makes frequent reference to her relationships with some youth she appears to have met, and this circumstance may have played its part in precipitating the attack. The treatment at home, under the best conditions available, is producing a gain in weight, and otherwise giving indication of favourable results.

CASE 6.—L. M., female, 41, married; housework. As regards family history, two brothers are stated to have died of convulsions when a month or two old; one sister to have died of the same. The patient herself was a somnambulist as a girl; once walked up the street at night in an unconscious state. This attack (duration three to four months) stated to have followed influenza; menses still regular; the patient now complains of various morbid sensations, such as "swellings in the neck," "weakness of the legs," "machinery in the head"; these distract her attention and cause exasperation with uncontrollable impulse, so that she is reported to have put her head in a gas oven once and to have attempted to injure herself with a razor. At present can only be treated at home.

Cases 7 and 8 are probably best adapted for treatment under heading D.

CASE 7.—N. O., female, aged 19, lives at home. Mother states she had ten children; four died in infancy, two with seizures; one of the six living started fits aged 2 years, and had them rarely until aged 21; none since (now aged 26); paternal grandmother of present patient died in county asylum; paternal uncle now there; paternal grandfather committed suicide; intemperance in father's family; stated to be some consumption on the mother's side. Mother a very intelligent woman. The patient could have earned her living (as far as intelligence goes) had it been necessary; she started having fits three years ago at night and early in the morning rarely (only one to two weekly). Once had a series of them. The mother attributes the first seizures to shock due to an assault, apparently with attempt to rape; regular after the above, but for last two years amenorrhœa. Leucorrhœa since last May; was in the county asylum for a while last year. There is no marked mental deterioration. Transferred to the gynæcological clinic. Uterus anteroverted, possibly endometritis; treatment of the amenorrhœa suggested. Requested the gynæcologist to continue treatment for the present, and pass her back to the psychiatric clinic in due course.

CASE 8.—P. Q., male, aged 35-40; bank employee. Served in Mesopotamia during the war; no history of illness or wounds; no family history of mental or allied disorders admitted. First attack; always of a worrying temperament; present condition has been going on for several months; believes his books will not bear auditing; that they have been falsified by him; that this and similar dishonest deeds of his are about to be brought to light; the fear of what will happen to his family oppresses him; is entirely self-centred and incapable of attention; lies in bed moaning. The day before I saw him he wandered from home, returning late with his leg-coverings soaked; said he had walked into the sea, not having control of his actions; has no clear recollection of events. The usual general physical reduction exists, but no specific disease. Certified to a registered hospital for the insane, where he is going on well.

Conclusion.

If the psychoses are to be dealt with under a three-hospital system a modification of the Lunacy Laws will be necessary, and therefore the recent presentation in the House of Commons of the Ministry of Health (Miscellaneous Provisions) Bill, which authorises under Clause 10 the care and treatment of cases of mental disorder "incipient in character and recent in origin," notwithstanding the provisions of any existing Act, is welcome. I observe nothing in the proposals of the Minister of Health which would render impracticable the scheme of care and treatment herein outlined, though the observance of certain formalities, such as the notification of reception, the production on authorised demand of written consents and certificates, is likely to prove irksome and to cause resentment at the outset. No vivid imagination is needed to forecast the administration hereafter, in whole or in part, of a three-hospital system, under Clause 11 of the Bill, by local authorities. These should meantime be diligently advised to insist on provision under any such system for cases of the psychoses and psychoneuroses. Superintendents and administrators of hospitals might be well advised to contemplate their future responsibilities under the new order of things. The annual production of "consents" and "certificates" will be a bagatelle compared to the quarterly requirements of the representatives of the ratepayers.

LOBAR PNEUMONIA.

A CLINICAL ANALYSIS OF 558 CONSECUTIVE CASES.

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THAT one observer should have been privileged to see within two and a half years no fewer than 558 cases of lobar pneumonia is, I venture to think, sufficiently confirmatory of the view that medical officers during the past war were afforded exceptional opportunities to practise medicine upon an intensive scale. I have selected for consideration a disease which is particularly suitable for statistical investigation. Lobar pneumonia presents features which make a correct diagnosis a matter of practical certainty; it occurs sufficiently frequently to provide a conveniently large number of figures from which to draw conclusions; and as regards incidence no special peculiarities of military life can be said to vitiate comparisons with its occurrence in civil practice. From the personal standpoint it is a matter of some importance that every case was seen from the first day (and generally from the first hour) of its arrival in hospital, and that the progress throughout to its termination was systematically investigated. For these reasons errors of observation became reduced to the lowest possible limits—the errors of observation of one clinician; whilst the circumstance that the treatment of every case was actually ordered or personally supervised by the same person removes any implication as to individual skill, and so affords an indication as to the dependence of mortality upon details which relate solely to the patients themselves.

I have excluded a few cases which occurred in the Aldershot Command which were probably cases of lobar pneumonia but about which some doubt in the diagnosis remained to the end, and no case is comprised in my series which could not according to accepted criteria be legitimately included. The investigation terminated suddenly in October, 1917, on my transference from the Aldershot Command when urgently mobilised for service overseas; and on my return to the Command for the rest of my military service the supervention of the influenza epidemic, with its anomalous pulmonary complications, rendered it impossible to differentiate unequivocal cases of true lobar pneumonia.

It must be admitted with regret that all the advantages afforded by this unique opportunity were not realised. Attention was from the outset particularly directed to clinical features. Much might have been done, however, to trace the connexion between incidence and climatic peculiarities, seeing that a selected body of men living under identical conditions was under consideration. Undoubtedly, had adequate meteorological observations been utilised many interesting facts would have emerged. But in the earlier months of the investigation such possibilities were not appreciated. Furthermore, statistical inquiries during the war were not only discouraged but rigidly forbidden. It was, in fact, only recently that I was enabled to procure the necessary information as to the number of troops actually serving month by month in the Command during the period comprised. To have proceeded further in an endeavour to elicit certain details relating to individual units would at that time have demanded opportunities which for many reasons were not forthcoming. The exigencies of military service regarded a home hospital as mainly a pied-à-terre or distributing centre for medical officers proceeding overseas; the minimum of skilled assistance was therefore available, so that elaborate investigations of the patient's family history, past life, and other personal details were necessarily neglected. For the same reason pathological work was at this time reduced to the lowest possible minimum, and the frequent changes in personnel precluded any systematic research.

For these reasons, then, my contribution is almost entirely clinical; nevertheless, I think the investigation of so large a number in so comparatively short a time may not be without interest and perhaps value, more especially when it is emphasised that conclusions are based upon cases drawn from a relatively selected population as regards age and physique, all living under practically identical conditions.

Incidence.

Table I. illustrates the incidence of cases month by month and at the same time comprises the distribution according to age. The average strength in the Command is also exhibited in order that the proportion of cases to total population can be scrutinised. The table also shows the mortality according to incidence, and briefly analyses the death-rate throughout the series according to the age of the patients.

A contemplation of this table leads to some rather bewildering and at first sight inexplicable results. In the first place, it will be seen that there is no evidence of a regular seasonal incidence. It is difficult to explain the large number of cases encountered in May, 1915, a preponderance which is not apparent in the corresponding month in 1916 and 1917. Contrast also April, 1916, with April, 1917, and, as an even more striking example, November, 1915, and November, 1916. One might have suspected as a possible explanation of the fluctuating numbers corresponding variations in the total number of troops present in the Command, but the figures which I have recently obtained show that such variations do not run pari passu with the incidence of the disease. The incidence must have depended upon a large number of different circumstances—possibly climatic conditions, temperature, humidity, prevailing winds, and so on, with which I am unable to deal. Above all, I am convinced that the incidence must have depended largely upon the physique of the troops stationed in the Command, which certainly varied enormously according to military exigencies. Had it been possible to take an exhaustive survey of the troops, particularly as regards

TABLE I.—*Incidence and Mortality according to Age and Season.*

—	Under 20.	20-30.	30-40.	40-50.	Above 50.	Total cases.	Monthly strength of Aldershot Command.	Deaths.
1915								
April	8	4	8	—	—	20	134,670	4
May	11	32	4	4	—	51	113,482	5
June	12	22	14	—	—	48	154,081	4
July	6	11	7	1	—	25	121,106	2
Aug.	7	5	4	2	—	18	97,647	2
Sept.	6	5	7	4	—	22	92,897	3
Oct.	—	6	10	—	—	16	121,531	1
Nov.	11	17	2	8	—	38	125,203	4
Dec.	6	5	5	5	—	21	123,727	1
1916								
Jan.	7	3	9	2	—	21	129,332	0
Feb.	1	11	11	1	—	24	117,733	4
March	9	7	2	—	—	18	102,427	1
April	2	4	1	2	—	9	120,794	0
May	2	4	2	2	—	10	111,949	1
June	1	3	3	1	1	9	100,108	2
July	4	1	4	2	—	11	115,883	2
Aug.	10	12	3	—	—	25	110,842	2
Sept.	4	9	—	—	—	13	99,217	0
Oct.	1	4	4	—	—	9	111,965	1
Nov.	1	6	1	1	—	9	119,490	3
Dec.	5	7	9	2	1	24	112,981	6
1917								
Jan.	2	3	5	1	—	11	112,971	0
Feb.	4	11	10	1	—	26	97,137	6
March	6	5	7	1	—	19	90,342	2
April	9	6	4	3	—	22	101,622	2
May	3	4	5	3	—	15	111,538	1
June	4	1	1	—	—	6	114,358	1
July	1	5	1	2	—	9	109,448	0
Aug.	4	—	1	—	—	5	106,906	1
Sept.	1	—	2	1	—	4	107,247	0
Total	148	213	146	49	2	558	—	61
Deaths	9 (6·1%)	21 (9·9%)	20 (13·7%)	9 (18·4%)	2 (100%)	61 (10·9%)		

their category, I feel no doubt a definite relation between susceptibility and constitution would have been definable.

It is easy to explain the curiously high incidence in August, 1916, when no fewer than 25 cases occurred. During this month a Canadian contingent was transferred direct from Canada to the Command, and the change of climate appeared to have been badly resisted, for of the 25 cases 18 were Canadians. (The cases were typically croupous pneumonia, and there was no question of an influenzal element.)

My conclusion as regards physique is supported by a consideration of the length of service of men affected. Of course, the army during the recent war consisted for the most part of men who had seen no previous service, so that by April, 1915—when my investigations at Aldershot were begun—a huge majority of men in the Command possessed less than eight months' service, and throughout the war recent recruits dominated the strength of the Command. Nevertheless, these observations extended to September, 1917, by which time the war had been over three years in progress, yet the striking fact is obtained that of the total cases seen no fewer than 62 (i.e., 11 per cent.) fell sick with the disease *within 12 days* of joining up; 119 cases (21·3 per cent.) in less than one month from enlistment; 227 (50 per cent.) in less than six months; whilst, finally, no fewer than 523 cases (93·7 per cent.) had had less than 12 months' service. I suggest that the change to military conditions—exposure, overcrowding, and other factors inseparable from army life—naturally determined this susceptibility of the more feeble.

Detailed descriptions of general physique are not forthcoming, and I can only give a general impression in stating that over and over again I was greatly struck by the wretched development of the recruits who came in sick.

It will be observed that only two men over 50 are included in the series—one would naturally encounter few men of this age—and that both succumbed. The service of one man was 13 months; of the other 15 months. The total mortality (10·9 per cent.) compares favourably with the mortality encountered in cases of pneumonia occurring in the general population, which in 1065 cases collected in 1884 by an Investigation Committee[1] amounted to 1 in 5·5—i.e., 18·2 per cent.

Of 673 cases which occurred in the Middlesex Hospital between 1880 and 1889 116 died—i.e., 17 per cent., and annual variations between 12 and 24 per cent. were encountered. One would naturally expect a lower mortality in such a series of cases as the one now presented, for the men were to a certain extent selected, and, speaking generally, excluded the aged, debilitated, and alcoholic, and eliminated all the principal adventitious causes which contribute to fatality. My percentage of fatal cases constitutes an intermediate between the average population and a body of men scrupulously selected for their physique. Osler[2] quotes statistics of picked men in the German Army, where among 40,000 cases a mortality of only 3·6 per cent. occurred. (In the same place he gives the record of 658 cases occurring in 16 years at the Johns Hopkins Hospital with a mortality of 200 (30·4 per cent.))

Initial Symptoms.

In interrogating patients upon their arrival in hospital regarding the onset of their illness leading questions were at first as far as possible avoided and direct suggestions were subsequently put with reference to certain of the commonest symptoms. The following table of symptoms (Table II.) gives their numerical frequency and percentage of total cases.

Table II. calls for little comment. Pain in the side was generally, but not invariably, restricted to the side in which signs of consolidation subsequently appeared. Headache one would naturally expect to be of fairly frequent occurrence. In my series six suffered from pneumococcal meningitis, and in a further 25 cases the symptom was of such severity that a provisional diagnosis of cerebro-spinal fever was made and lumbar puncture performed.

A complaint of difficulty in breathing was very infrequent; bronchitis, as will be seen, was advanced as a definite initial symptom in 40 cases, and these, for the most part, were subjects who were chronic sufferers from chest trouble. In 13 cases the only complaint was of sore throat. Of the 9 patients who complained of

TABLE II.

Symptom complained of—	No. of cases.	Per cent. of total cases.	Symptom complained of—	No. of cases.	Per cent. of total cases.
Shivering	381	69·0	Pain in abdomen	31	5·5
Pain in side ...	345	60·0	Tonsillitis	13	2·3
Headache	196	35·6	Dyspnœa	11	2·0
Vomiting	181	33·0	Pain in legs ...	11	2·0
Cough	132	24·0	Hæmoptysis ...	9	1·6
Pains all over ...	50	9·0	Diarrhœa and vomiting	3	0·5
General malaise	42	7·6			
Bronchitis ...	40	7·0			

hæmoptysis one was a case of trauma to the chest wall; and, bearing in mind the type of condition subsequently seen in the influenza epidemic, it is not altogether unlikely that three were of influenzal origin.

In 7 cases pain in the abdomen was so severe that they were sent in with the diagnosis of acute appendicitis. Three actually underwent operation for this condition, the appendix being found free from disease; and 3 others reached the theatre and underwent preparation for operation. In all these "abdominal" cases unequivocal signs of lobar pneumonia appeared in due course. From these figures it would appear that the simulation of acute appendicitis is not so common as is sometimes suggested.

Condition on Admission.

It is the usual practice in the army to transfer to hospital with the least possible delay all men who report sick with pyrexia, save of the most trivial character. In certain units provision is conveniently made for the isolation of the sick for observation, and, as is well known, a certain type of man regards it as infra dig. to report sick until he is in a state of complete prostration. With these few exceptions, however, the large majority of my series were admitted to hospital a short time after the onset of the illness. The accompanying table (Table III.) illustrates the condition on admission as regards the degree of pyrexia on their arrival in the ward.

TABLE III.

Temp. on admission.	No. of cases.	Per cent. of whole.	Temp. on admission.	No. of cases.	Per cent. of whole.
Below 98°	15	2·7	102°–103°	155	27·7
,, 100°	39	7·0	103°–104°	131	23·4
100°–101°	34	6·0	Above 104°	84	15·0
101°–102°	115	20·5			

The cases who exhibited a temperature below 98° were in a state of collapse, and with the rare exceptions of those who never rallied showed pyrexia of over 101° within six hours of admission. It will be observed that over 70 per cent. cases on admission showed a temperature between 101° and 104° and over 50 per cent. between 102° and 104°. A temperature higher than 105° was very infrequent, in three of my cases only.

Pulse-respiration ratio.—This is usually held to be typically about 3 : 1 in cases of lobar pneumonia. In my series, although variations were very frequent, in 80 per cent. of cases the pulse-respiration ratio was between 3 : 1 and 4·5 : 1. These figures are substantially lower than those given by Osler (2 : 1; 1·5 : 1) which I observed in about 12 per cent. cases only.

Knee-jerks.—A special investigation of this feature was made since it has been mentioned that loss of tendon jerks is a usual feature in lobar pneumonia and that the phenomenon affords a valuable method of differentiation from an acute abdominal condition. The knee-jerks were abolished in 138 cases (24·7 per cent.). They were feebly present in 69 cases (12·4 per cent.). They were present to a degree which might be described as normal in 248 cases (44·4 per cent.) and

they were definitely exaggerated in 103 cases (18·5 per cent.). I believe that the original observation (which I have been unable to trace) was conducted at a time when it was not customary to employ the now familiar "knee-jerk hammer," without which a considerable number of sluggish and even normal knee-jerks would be overlooked and so contribute to an apparently large number of cases of abolition of the knee-jerk. If the test is properly performed it would not appear that any diagnostic value can be said to be attached thereto.

Signs in the Chest.

The figures in Table IV. refer to the time of appearance of the earliest definite signs of consolidation, not suggestive features such as crepitations or slightly prolonged expiration. It will be seen that in nearly 80 per cent. cases signs appeared within four days of onset of

TABLE IV.—*Time of Appearance of Signs of Consolidation.*

Day of appearance.	No. of cases.	Per cent.	Day of appearance.	No. of cases.	Per cent.
Day of illness—			Day of illness—		
First	12	2·15	Sixth	32	5·7
Second ...	152	27·2	Seventh ...	24	4·3
Third	161	29·0	Ninth	1	—
Fourth ...	115	20·0	Signs completely absent	12	2·15
Fifth	49	8·8			

the illness. Although in 12 cases no signs of consolidation could be detected throughout the course of the illness these cases were from other features unmistakably cases of true lobar pneumonia.

Distribution of Areas of Consolidation.

It is, I think, generally agreed that the right lung is affected more frequently than the left. Osler gives in 100 post mortems: R. lung, 51 per cent.; L. lung, 32 per cent; both lungs, 17 per cent. These figures are a close approximation to mine (Table V.), which, it

TABLE V.

Area.	Cases.	Per cent.	Area.	Cases.	Per cent.
Right lower lobe	191	34·2	Left apex	8	1·4
Right apex... ...	64	11·5	Both lungs ...	115	20·6
Left lower lobe...	168	30·0	Signs absent ...	12	2·2

must be observed, however, correspond to clinical observations, not to more exact post-mortem findings. It is, further, universally maintained that the lesion of "double pneumonia" is more serious than when one lung only is affected. This is certainly supported by my series, for in 115 cases of double pneumonia 33 deaths occurred—viz., 28·7 per cent.—as compared with a mortality of 10·9 per cent. when all cases are considered.

Sputum.

Table VI. gives the day of appearance of typical rusty sputum. It will be observed that, as in the case of the time of appearance of physical signs, the second, third, and fourth days predominate. In quite a con-

TABLE VI.

Day of appearance of rusty sputum.	No. of cases.	Per cent.	Day of appearance of rusty sputum.	No. of cases.	Per cent.
Day of illness—			Day of illness—		
First	4	—	Sixth	48	8·6
Second	97	17·4	Seventh ...	19	4·5
Third	135	24·2	Eighth ...	6	
Fourth	123	22·0	Sputum entirely absent	61	10·9
Fifth	65	11·6			

siderable proportion of cases—viz., 10·9 per cent.—sputum was never evident, a large percentage in comparison with the cases in which physical signs were absent or rather not detected. Of 100 cases observed by Emerson 16 had no sputum or "very little."[2]

Herpes.

Herpes labialis—no other situation was observed—was seen in 95 cases—i.e., 17 per cent. Of these only four died (4·2 per cent.), once again confirming the popular impression that the prognosis is more favourable in cases when herpes is present. Geissler[3] observed it in 182 out of 421 cases (43·2 per cent.). Osler gives its occurrence as 12 per cent. (40 per cent.).

Termination.

Crisis.—This occurred in 315 cases, including 5 in whom death subsequently took place and 28 who developed empyema. Table VII. illustrates the day upon which crisis occurred, reckoning from the onset of symptoms.

TABLE VII.

Day of crisis.	No. of cases.	Per cent.	Day of crisis.	No. of cases.	Per cent.
Third	25	8·0	Eighth	30	9·5
Fourth	8	2·5	Ninth	16	5·0
Fifth	65	20·6	Later than ninth... ...	22	7·0
Sixth	36	11·4			
Seventh... ...	113	36·0			

I had gained the impression that termination by crisis was relatively less frequent in the Aldershot Command than elsewhere, but my percentage (56·5 per cent.) corresponds very closely to that given (60 per cent.) by Powell and Hartley.[4] Table VII. confirms the general acceptation that the seventh day is the commonest upon which crisis occurs and the ancient belief that the odd days predominate over the even days. I think it probable that the figures for the seventh day should be augmented at the expense of those given for the sixth and eighth days, as in many of these cases some uncertainty as to the day of onset of the illness was present.

Termination by Lysis.

In this connexion one must, in order to obtain figures for the frequency of lysis in uncomplicated cases, exclude not only the 315 cases in whom crisis occurred, but in addition 56 cases in whom death (antecedent to, or in the absence of, crisis) resulted, 88 cases when empyema developed, and 12 other cases with other complications in whom crisis did not occur. This leaves a residue of 87 cases—that is to say, lysis occurred in 15·6 per cent. cases without complication.

Complications.

Empyema occurred in 116 cases—i.e., 20·8 per cent. This is a proportion considerably larger than the general experience, for of 7394 cases investigated by Hector Mackenzie as regards complications,[5] empyema was present in only 3·48 per cent. Two circumstances explain the very large percentage in my cases. In the first place, I think there can be no doubt that empyema is relatively a very much more common complication in the Aldershot Command than generally. In the second place, empyema is probably very frequently overlooked because the diagnosis of "unresolved pneumonia" is accepted when physical signs persist in the chest and the patient's general condition does not suggest the presence of pus. Exploration of the chest was a routine proceeding at Aldershot; and whilst no undesirable effects ensued from the operation I am certain that empyema was ascertained and the duration of the illness reduced in many cases in which suspicion of its existence would not have been aroused. Finally, some of the cases included in my series would not be regarded as legitimately empyema in the restricted sense of thick pus (with or without organisms) demanding resection. Of my 116 cases 30 only required resection. In the remaining 86 cases aspiration only on one or two and rarely three occasions was found to be sufficient to cause complete resolution. Such a proceeding naturally cleared up those effusions of a thin serous character containing few pus cells or mononuclears only, but I was certainly surprised at the efficiency of this simple treatment when really thick pus was present, as in the other 60 cases, in 24 of whom

organisms (pneumococci or streptococci) were also identified. Resection was always adopted when it was manifest that extensive drainage was necessary, but I would recapitulate that 86 cases were successfully treated by aspiration alone, of which 26 exhibited thin fluid, usually hæmorrhagic and containing mononuclears and few pus cells; 36 thick pus, in which organisms were not demonstrable; and 24 thick pus, containing pneumococci or streptococci. The average period for complete recovery was so short as compared with that of a resection, even a thoroughly satisfactory one, that I am convinced as to the value of this form of treatment, provided the patient's general condition is carefully watched; and even if resection is regarded as desirable, I believe previous thoracocentesis to be an advantageous preliminary.

Among the 116 cases of empyema 23 deaths occurred—i.e., practically 20 per cent. In the series of 7394 cases already quoted the frequency of empyema is given at 3·48 per cent., with a mortality of 1·12 per cent. Even if one excludes the relatively trivial cases and admits only those with considerable pus formation, the occurrence of empyema in the Aldershot Command must have been relatively very high, at least 14 per cent., and the empyema death-rate then rises to 27 per cent., which approximates to the usual expectation. I must at this point express the conviction that influenza played no part in the production of empyema in this series. When the epidemic occurred the percentage of empyema in pneumonic cases was exceedingly high.

Other Complications.

Meningitis occurred in 6 cases—i.e., approximately 1 per cent. The infection in all was pneumococcal and a fatal result ensued in all. Meningismus (i.e., a condition suggesting the possibility of meningitis of some form or other and for which lumbar puncture was performed) occurred in no fewer than 25 cases (i.e., 4·5 per cent.), all of whom recovered.

Pericarditis was discovered in 11 cases only (i.e., 2 per cent.), which is little more than half the percentage given in the big series above referred to and less than half in that of Osler (35 out of 658). Four of the cases died (i.e., 36 per cent.), a much lower figure than that given in Dr. Mackenzie's cases, in which the mortality is just over 70 per cent., and still lower than Osler's 89 per cent.

Infective endocarditis was encountered in 4 cases (0·72 per cent.), which corresponds closely to Dr. Mackenzie's 0·83 per cent.—all 4 cases died.

Of less serious complications or accompaniments *jaundice* was prominent in 7 cases, *arthritis* in 2 cases, *nephritis* in 2 cases, *colitis* in 1 case, and extensive venous *thrombosis* in 1 case. *Delirium* was a very prominent feature in 22 cases (4 per cent.) and 3 cases were actually admitted as cases of acute mania. Among other complications referred to by Dr. Mackenzie, none of which were observed in my series, are peritonitis (0·31 per cent.); otitis media (0·33 per cent.); parotitis (0·05 per cent.); and peripheral neuritis (0·05 per cent.)

Finally, it may be noted that of the 61 deaths 23 occurred in cases with empyema, 6 in cases with meningitis, 4 in cases with pericarditis, and 4 in cases with infective endocarditis. These complications were duplicated on some occasions, so that 28 deaths took place in cases free from any complication.

I am indebted to so many colleagues for their valued assistance that a general expression of gratitude must suffice, but I cannot refrain from a special reference to Dr. Herbert French, late Lieutenant-Colonel, R.A.M.C., and consulting physician to the Aldershot Command, for his generous advice and encouragement and assistance during the greater part of this research.

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AN EXPERIMENTAL STUDY ON THE ORIGIN OF IDIOPATHIC NEPHRITIS.*

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OUR knowledge of the ætiology of parenchymatous nephritis is largely based on clinical experience. It is a familiar fact that an acute nephritis may arise in the course of many specific infections, and the production of nephritis by various chemical agents has been the subject of numerous experiments. But such modes of origin are notoriously difficult to account for the majority of cases of acute and chronic parenchymatous nephritis admitted to hospital. Hence the designation "Idiopathic Nephritis" still remains as a term of reproach in our text-books.

Bacteriological examination of the urine from cases of acute nephritis has, in the hands of Scheidemandel[1] and others, shown that pyogenic bacteria are occasionally responsible for the disease. In such cases *Staphylococcus aureus*, streptococci, and *Bacillus coli* (the last in insufficient numbers to cause obvious bacilluria) have been obtained on culture of the catheter urine. The causal relationship of these organisms is shown by their disappearance from the urine on recovery of the patients and by confirmatory blood cultures in severe cases. Clinically, the more obviously septic cases are characterised by fever, tenderness in one or both loins, and the appearance of numerous leucocytes in the urine; but in milder forms the picture may be that of a diffuse nephritis.

In chronic cases of parenchymatous nephritis the urine is usually sterile. But in view of the work of Hort,[2] who employed the urine itself as a culture medium in cases of obscure general infection, I resolved to use incubated urine from a series of cases of nephritis and inject it into animals in the hope of reproducing the disease. At the same time, cultures of this or other material would check any results obtained. This mode of experimentation was based on the assumption that cases of idiopathic nephritis are due to some unrecognised infection of the kidney and that the causative organisms are present with the products of inflammation in the urine and in the kidney itself.

Experiments with Renal Substance.

Soon after the beginning of this investigation I was able to secure a kidney from a patient who had died of acute nephritis complicated by pleurisy with effusion (Case No. 10300). Dr. Yussef Barrada, medical resident at the hospital, had shown a keen interest in the work, and removed the kidney aseptically within two hours of death.

Portions of this organ were at once placed in tubes of sterile liquid serum, while another piece was ground up with normal saline.

Fresh emulsion.—The emulsion in saline was injected into the peritoneal cavity of a guinea-pig. This animal survived, and no albumin could be detected in its urine.

Culture in liquid serum.—These tubes were kept in an incubator for two days and then in a warm room for 15 days. 1 c.cm. of the fluid from one tube was then injected intraperitoneally into guinea-pig (A). The animal died in six days. Autopsy showed effusion into both pleuræ, and some lymph adhering to the liver and covering the spleen, which was greatly enlarged. The kidneys were congested, and on section showed marked degeneration of the tubular epithelium with casts in situ.

From the organs of the dead pig and from the material injected pure cultures of a very short Gram-negative bacillus were obtained: they were shown to be identical by the sugar reactions.

Subcultures.—From another tube of serum in which a piece of the human kidney had been placed a subculture was made on blood-agar. This showed a growth of the same bacillus described above, with some yeast cells. The growth when a week old was washed off with sterile saline: half was injected into a pig (B), the rest was passed through a Berkefeld filter and at once injected into the peritoneal cavity of another pig (C). Pig (C) injected with the filtrate showed a trace of albumin in its urine, but recovered. Pig (B) showed distinct albuminuria and died in seven days. The

* A paper read at a meeting of the Staff Club, School of Medicine, Cairo.

post-mortem appearances were the same as in pig (A). The kidneys showed an acute hæmorrhagic nephritis. Cultures from the heart, blood, and organs recovered the bacilli without yeast cells.

A pure culture was obtained from plating the original subculture and small doses were injected subcutaneously into a white rat and into a guinea-pig. The rat showed distinct albuminuria by the third day, but no albumin could be detected in the alkaline urine of the pig. Both animals were painlessly killed on the fourth day. Agar cultures of the heart blood, kidney, and urine were sterile in each case. Sections of the kidney in both animals showed cloudy swelling of the convoluted tubules with intratubular debris, much hyperæmia, and occasional hæmorrhages.

Passage.—An agar culture from the kidney of pig (B) was emulsified and injected into two other pigs (D) and (E). Pig (D) was injected intraperitoneally and died the next day. The spleen was very greatly enlarged and the kidneys showed acute degeneration of the tubular epithelium. Pig (E) was injected subcutaneously and died in five days. No albumin could be demonstrated in its urine during life. Post-mortem the spleen was enlarged, but there was no lymph adherent to it or to the liver as in all the other pigs dying after intraperitoneal injection. The kidneys showed a conspicuous degeneration of the tubular epithelium. From both pigs the original bacillus was recovered.

The culture obtained from the original pig used (Pig A) was subcultured four months later and grew well. A guinea-pig was injected subcutaneously with a small dose and was killed a fortnight later. From this pig bouillon cultures were taken of the urine (obtained at autopsy from the bladder) and from three pieces of a kidney. The urine and two of the kidney tubes yielded a pure culture of the bacillus injected; the remaining tube was sterile.

The other kidney and a portion of the liver were sliced and fixed in Zenker's fluid. The kidney on section showed a striking degeneration of the epithelium of the convoluted tubules with casts in situ. The liver changes were remarkable; there was widespread necrosis of the cells and hæmorrhages into the liver substance.

Summary.—In this case the features of the disease in the human patient were successfully reproduced in animals. The causative organism was obtained in pure culture and recovered after passage through two sets of animals.

Investigation of Urine.

Material for this work was obtained from 25 consecutive cases of parenchymatous nephritis admitted to my wards. These patients all showed general œdema, often extreme, with albumin and numerous casts in the urine; the more important features of each case are tabulated below. The clinical history elicited was often meagre, but in two cases examination showed that the nephritis was undoubtedly syphilitic in origin. Apart from these two no definite cause for nephritis could be found on examination of the patients.

For the collection of urine from the patients the following technique was finally adopted:—

A sterile rubber catheter was passed with full antiseptic precautions; since male Egyptians are circumcised, one common source of contamination was absent. After some urine had been allowed to escape the catheter was temporarily compressed and its exit end well flammed. Some 10 c.cm. of urine were then collected in a stout sterile test-tube during momentary removal of a sterile rubber stopper. Afterwards the end of the tube and the stopper were again sterilised in the flame. Before the use of rubber stoppers contamination of the urine was liable to occur after some time, but the avoidance of cotton plugs overcame this difficulty. It is advisable to use a couple of tubes for each patient, one for incubation and culture, the other for direct microscopical examination of films prepared from the sediment, both fresh and stained by Gram's method.

According to the results of experiments and bacteriological examination of the urine these cases of nephritis may be arranged in four groups (A, B, C, and D).

Group A.—These urines showed a considerable excess of pus corpuscles (as well as casts), and bacteria were readily found on direct microscopical examination of the fresh deposit.

(*a*) In the male patients (first 5 cases) this complication was due to a septic cystitis following bilharzial disease of the bladder. In ordinary cases of bilharziasis the discharge of ova gives rise to hæmaturia only, and the urine is sterile. But in long-standing cases a bacterial infection is apt to follow, and often persists after the bilharzial worms have perished. Although a septic extension to the kidneys may terminate such cases, this rarely presents the picture of an ordinary parenchymatous nephritis, and in the examination of over 400 patients suffering from bilharzial disease of the bladder, many of whom had pyuria, I only found one urine containing renal casts, and this man had developed dropsy. Hence, bearing in mind the extraordinary incidence of bilharziasis in Egypt and the comparative rarity of parenchymatous nephritis, there does not appear to be any close relationship between these diseases.

(*b*) In the three female cases there was no evidence of bilharziasis. One patient (Case No. 10741) had obvious colon bacilluria; in the second (No. 11203) there was a pyuria of doubtful origin (tubercle bacilli not found), while in the third (No. 702) a malignant growth of one kidney was found post mortem. But as all three patients showed the usual symptoms and signs of parenchymatous nephritis they have been included in the list.

Injection of these urines, especially after incubation, was generally fatal to guinea-pigs. The animals succumbed in a few hours to a septicæmia, and from their blood and organs the causative bacteria were recovered. Direct examination of the urinary sediment and of cultures taken showed in most cases a mixed infection, in which Gram-negative bacilli predominated. Very different types of these organisms were found in the different urines, together with Gram-positive bacilli and cocci in some instances.

Group B.—These cases of nephritis were complicated by urinary bilharziasis, but without signs of any septic infection. The urine contained abundant casts, some blood corpuscles, and bilharzia ova more or less embedded in cells, chiefly eosinophiles. The fresh urine was sterile and appeared innocuous on injection into the peritoneal cavity of a guinea-pig. But after a short period of incubation the urine of the first two cases showed a growth of Gram-negative bacilli, and killed guinea-pigs in six hours with a dose of 3 c.cm. From the last two cases in this group Gram-positive bacilli were isolated, but grew feebly on agar.

Case No.	Age.	Duration of œdema.	Examination of urine. C.cm. per diem.	Alb. per 1000.	Pus.	Growth.	Remarks and complications.
A	7286	29	6 mos.	1000	6	+++	Mx.	Cystitis.
	8934	31	3 wks.	400	15	++	Pos.	—
	2862	30	4 mos.	600	4	++	Mx.	—
	599	24	5 ,,	1700	4½	+	,,	—
	10774	20	1 wk.	1000	13	+	Pos.	Syphilis.
	10741	25	3 mos.	900	9	+	Mx.	Bacilluria.
	11203	30	4 ,,	600	½	+	,,	Fever.
	702	50	2 ,,	500	7	+	,,	Malignant growth.
B	11082	25	4 wks.	2000	4	+	Pos.	—
	10821	15	4 ,,	500	1½	+	,,	Amœbic dysentery.
	2136	40	10 mos.	2500	6	+	,,	—
	3360	22	4 wks.	1400	3½	+	,,	—
C	10300	28	3 wks.	400	6	0	,,	Pleurisy; died.
	1814	6	10 dys.	250	1	0	,,	Banti's disease.
	1946	30	10 wks.	400	3	0	,,	—
	2021	25	2 mos.	1000	1	0	,,	Malaria; ankylostoma.
	2179	20	1 yr.	800	9	0	,,	Bronchitis; ankylost.
	5170	10	5 dys.	450	1½	0	,,	Fever.
	10701	30	5 mos.	1000	10	0	Om.	—
D	303	65	2 ,,	300	5½	0	Neg.	—
	4107	65	4 wks.	600	3	0	,,	Bronchitis.
	4621	37	3 ,,	1200	3½	0	,,	—
	3079	27	3 yrs.	700	31	0	,,	Syphilis.
	4397	24	5 mos.	800	¼	0	,,	Heart dilated.
	4666	40	3 wks.	750	3	0	,,	—

Mx., mixed. Pos., positive. Neg., negative. Om., omitted.

Group C.—These urines showed no signs of any complicating disease of the urinary tract. Cultures taken from the fresh catheter urine were often sterile, but after the urine had been incubated for one day or longer a positive result was obtained. In all these cases the cultures showed a pure growth of short bacilli, Gram-negative and aerobic. Animals which died as the result of injection or had been purposely killed to ascertain the effect were found to have developed a distinct nephritis.

Group D.—The urines in this group were free of all signs of complicating disease. They were sterile on culture and remained sterile for weeks on incubation. Three urines which had remained sterile on incubation were tested for their toxic effect. The urine was injected subcutaneously into a guinea-pig which was killed after a week and the organs at once fixed in Zenker's fluid for microscopical study. Case 4107: This urine was obtained from a case of subacute or chronic nephritis and contained 3 parts per 1000 albumin. A guinea-pig injected with 3 c.cm. incubated urine was killed ten days later. The liver and kidneys were normal on careful microscopical scrutiny. Case 3079: This urine resembled serum in appearance; it had a sp. gr. 1036 and contained at least 31 parts per 1000 protein (globulin being present). The patient had more or less œdema for three years and gave a positive Wassermann reaction. A guinea-pig was injected with 3 c.cm. and killed ten days later. Its liver showed areas of focal necrosis with hæmorrhages; the kidney some cloudy swelling and a few hæmorrhages. Case 1814: The fresh urine from this case of acute nephritis (Group C) was doubly filtered through a Berkefeld candle and remained sterile on incubation. 2·5 c.cm. was injected into a guinea-pig and the animal killed seven days afterwards. Microscopical examination of the liver showed a normal appearance; the kidneys were also normal except for a very slight cloudy swelling in a few of the renal tubules.

Summary.—The toxic effect of nephritic urine was shown to depend chiefly on the presence or absence of bacteria. In view of the precautions taken in the collection of the specimens and the absence of the usual contaminating organisms such as cocci and yeasts, the frequency with which pure cultures of Gram-negative bacilli had been obtained was significant. Further, these results corroborated those obtained from the experiments with actual kidney tissue already detailed, and indicated that further study of the bacilli isolated was necessary.

The Characteristic Organism.

The bacteriological part of this investigation was kindly undertaken by Dr. J. K. Clarke, who reports as follows.

Note by Dr. J. K. CLARKE.

"The organisms are all short, plump, Gram-negative bacilli, and their cultural characteristics are those of the coli-typhoid group. Some are motile, some non-motile; some produce indol from peptone water, others do not; and they differ in power of fermenting carbohydrates. The following are the reactions which they give:—

Case No.	Motility.	Glucose.	Lactose.	Dulcite.	Saccharose.	Mannite.	Maltose.	Indol.
11082	0	AG	AG	AG	AG	AG	AG	+
11203	0	AG	AG	—	—	AG	AG	+
599	+	AG	AG	AG	AG	AG	AG	+
10741	+	AG	AG	AG	—	AG	AG	+
7286	+	AG	AG	AG	—	AG	AG	+
10821	+	AG	—	—	—	AG	AG	+
702	+	A	—	A	—	A	A	+
10300	+	AG	—	AG	—	AG	AG	0
2021	+	AG	—	AG	—	AG	AG	0
5170	+	AG	—	AG	—	AG	AG	0
1814	+	A	—	—	—	A	A	0
1946	+	AG	—	—	—	AG	AG	0

A, acid formation; G, gas production.

As will be seen, the first five are lactose fermenters, 10741 and 7286 giving the reactions of *B. coli communis* and the others being closely allied. 10300, 2021, and 5170 appear to belong to the paratyphoid-Gärtner subgroup. 1814 and 1946 grew very slowly, in contrast to the remainder, whose growth was vigorous, and 1946 fermented glucose, mannite, and maltose only feebly. Another organism (No. 2149) could not be grown in subculture.

Agglutinating sera for the most important of the organisms are being prepared, and when these are ready further experiments will be carried out with a view to a more definite classification."

Injection of Cultures into Animals.

The relation of these organisms to nephritis was tested in two ways: (1) by injection of pure living cultures into animals; (2) by the use of killed cultures as vaccines for treatment of cases of nephritis in man.

Injection of cultures.—In planning these experiments advantage was taken of the results of previous experiments to avoid sources of error. Thus, it had been found that incubated urine and cultures of the organisms in fluid media were often toxic enough to kill guinea-pigs on intraperitoneal injection in comparatively small doses. The animal succumbed to a general septicæmia, and it was quite possible that the nephritis induced was due rather to a profound toxæmia than to a selective action on the kidneys. Hence, quite small doses of an agar culture emulsified in saline were preferable; the injections should be subcutaneous where any local irritant effect could be observed.

Secondly, it was obvious that the urine of guinea-pigs was quite an untrustworthy indicator of any nephritis present. The urine of these animals is so highly alkaline that tests for albumin were generally negative, even when an advanced degree of renal disease was undoubtedly present. So it was resolved to use white rats for preference, since these animals excrete an acid urine normally free from albumin.

Lastly, the experimental animals were to be killed at definite intervals, cultures taken, and specimens for microscopical study preserved in Zenker's fluid to obtain the best results.

For these experiments pure cultures from uncomplicated cases of nephritis were selected (Cases No. 1814, 1946, 2021, and 11082).

No. 1814.—This bacillus was obtained in pure culture from the urine of a boy ill with acute nephritis. Two rats (A) and (C) were each injected with 1·5 c.cm. of a fairly strong emulsion made from a subculture; a third rat (B) was injected with 1 c.cm. of sedimented urine after incubation.

All three rats developed an albuminuria within three days, and this persisted until they were killed after varying periods. At first the rats appeared somewhat ill and excreted little urine; later they showed no obvious symptoms. The albumin, precipitated by boiling, occupied from 1/10 to 1/6 of the volume of urine. Some pus corpuscles were present, but casts could not be identified. There was no swelling at the sites of inoculation.

Rat (A) was killed one week after injection. Agar cultures of the heart blood, spleen, and kidney remained sterile. The spleen was greatly enlarged, measuring 1¼ in. in length. On section the kidney showed definite hyperæmia and marked granular degeneration of the epithelial cells of the convoluted tubules, the changes being of wide but unequal distribution. The spleen showed a general hyperplasia.

Rat (B), injected with incubated urine, was killed after an interval of two weeks. As before, agar cultures of the blood and kidney remained sterile; the spleen measured 1 in. in length. On section the kidney showed marked hyperæmia with actual hæmorrhages into some tubules and glomeruli. There was widespread degeneration of the tubular epithelium, and a few glomeruli showed proliferation of the cells lining Bowman's capsule. In places a small-celled infiltration was seen between the tubules.

Rat (C) was killed six weeks after injection of the culture; it had shown persistent albuminuria. Cultures were negative; the spleen measured 1½ inches in length. On section of the kidney there was definite degeneration of the renal epithelium, affecting chiefly the convoluted tubules, with areas of well-marked infiltration of cells, more numerous in the cortex.

No. 1946.—This culture was obtained from a patient who had had nephritis for some ten weeks. 1·5 c.cm. of a fairly thick emulsion was injected subcutaneously into a rat. The animal developed an albuminuria, slight at first, but quite definite after ten days. It was killed five weeks after inoculation, and at this time blood corpuscles and leucocytes were found in its urine. On section the kidney showed hyperæmia with hæmorrhages between the tubules and into some glomeruli. The renal epithelium was degenerated, especially in the convoluted tubules; there was some proliferation of the capsular epithelium in certain glomeruli, and in places a small-celled infiltration.

No. 2021.—This culture was obtained from a case of nephritis of two months' duration; the patient had suffered from malaria, and had a typical attack while in hospital. 2 c.cm. of a thin emulsion of the culture were injected subcutaneously into a rat. Here, again, there was no local reaction, and it was some ten days before albumin was unmistakably present in the urine. The albuminuria, however, persisted until the animal was killed, six weeks later. At autopsy the spleen measured 1½ inches in length. The kidneys showed less epithelial degeneration than in the preceding animals, and there were no hæmorrhages, but a small-celled infiltration was evident in many parts of the cortex.

No. 11082.—This organism was obtained from the urine of a resolving case of acute nephritis. The urine contained some pus, but showed no evident bacteria. Cultures taken from a fresh catheter specimen were sterile, but after incubating the urine for 24 hours a positive result was obtained. 3 c.cm. of this incubated urine in an early experiment had been injected into the peritoneal cavity of a guinea-pig. The animal died in six hours, and from its heart's blood the original bacillus was recovered. Later, the culture obtained on passage was subcultured and a loopful emulsified and injected subcutaneously into another pig. This animal was killed after seven days and bouillon cultures taken of its blood, urine, and kidney. The cultures remained sterile. On section the kidney showed degeneration of the epithelium of the convoluted tubules, very marked in places, with tube casts in situ and occasional hæmorrhages. The liver showed profound degeneration—almost necrosis of many cells, especially at the centres of the lobules.

Two other guinea-pigs were injected with very small doses of a subculture of the original obtained from the patient's urine. One was killed a fortnight later and showed moderate degeneration of the cortical epithelium with a few hæmorrhages; cultures remained sterile. The second pig was killed after an interval of three weeks, and the results were similar. In this pig the liver was examined and showed very distinct degeneration of the cells.

Summary.—The results of these experiments with pure cultures of bacilli isolated from uncomplicated cases of nephritis may be summarised as follows:—

(*a*) General effects. Moderate doses did not produce a fatal septicæmia, but there was a well-marked swelling of the spleen which persisted for some time after the blood-stream was free of bacteria. This phenomenon, it may be remarked, is seen in cases of human typhoid, and a similar enlargement of the spleen has been reported in epidemic nephritis in civil life.

(*b*) Nephritis. The nephritis induced ran a distinct course which varied in intensity according to the virulence of the strain and amount of the culture injected. The chief changes were: An early hyperæmia with degeneration of the renal epithelium, most marked in the convoluted tubules. Later, more advanced degeneration with continued hyperæmia and hæmorrhages into the tubules and occasionally the glomeruli. Casts could be seen in situ. Lastly, some proliferation of the interstitial tissue. In no case did the nephritis show the characters of a septic infection. There were no intense glomerular changes nor leucocytic infiltrations.

(*c*) Liver changes. In the animals examined for such changes it was found that the bacilli had quite as marked an effect on the liver as on the kidneys. There was profound degeneration, amounting sometimes to actual necrosis, with hæmorrhages.

An interesting feature was the persistence of the renal lesions for weeks after no organisms could be detected on culture of the organ in animals killed at an earlier stage.

Experiments with Other Organisms.

In light of the knowledge gained of the effects of these bacilli obtained from cases of uncomplicated nephritis it was possible to apply the experimental test to other organisms isolated from cases where a secondary infection could not be excluded. This would also afford an opportunity to correlate the effects produced on the kidneys and the liver. For this purpose pure cultures of strains whose characters had been ascertained already were used. The same procedure was followed as in the first series, using the following organisms: (1) Intestinal types, Nos. 10741, 7286, 702, 11203, and 10821; (2) Gram-positive bacilli, Nos. 2136 and 3360.

In each series the animals were inoculated subcutaneously with approximately similar doses and killed at the end of a fortnight. In no case was there any noticeable reaction at the site of injection.

(1) The Gram-negative series showed a very interesting gradation of effect on the kidneys and liver, ranging from the slightest disturbance to an extremely severe lesion.

Organism No. 10741 gave the typical cultural characteristics of *Bacillus coli communis*. The pig injected with an emulsion and killed a fortnight later showed a normal liver and practically a normal kidney. This result was confirmed by an experiment on a rat which was injected with rather a large dose of a *B. coli* culture obtained from a case of simple bacilluria. The animal died in two days and the kidneys showed some hæmorrhages, but the renal cells showed little signs of degeneration.

Organism No. 7286 had a slight but distinct effect. The liver exhibited degeneration of scattered cells and the kidney showed some hæmorrhages and degeneration of the epithelium in various tubules.

Organisms Nos. 702 and 11203 showed a more powerful toxic effect. There was a diffuse degeneration of the epithelium in most of the renal tubules, especially in the cortex, with occasional hæmorrhages. The livers showed degeneration of many cells, with badly-staining nuclei, while the liver of the pig injected with No. 702 was studded with numerous hæmorrhages.

Organism No. 10821 had a profoundly toxic effect. The liver showed absolute necrosis with loss of cell outline and nuclei. In the kidneys the epithelium of tubules both in the cortex and medulla were highly degenerated with casts in situ and hæmorrhages.

A rat injected with the same culture was killed 30 days later. The liver exhibited distinct degeneration, while the kidneys showed a good deal of tubular degeneration with hæmorrhages. During life there was albumin present in the rat's urine.

(2) The Gram-positive bacilli isolated from cases Nos. 2136 and 3360 had little similar effect. A rat injected with organism 3360 failed to develop albuminuria. A pig killed a fortnight after inoculation with organism No. 2136 showed very slight degeneration in some of the renal tubules, but some excess of connective tissue. The liver of this animal exhibited a very distinct degree of early fibrosis; the hepatic cells were healthy.

Remarks.—The experiments showed that organisms of strictly *B. coli* type had little effect, while other strains which appeared closely related might cause severe degeneration of the kidneys and liver. In all cases the effect on these two organs was closely comparable.

Trial of Vaccines.

The ætiological significance of the cultures obtained from incubated urine in cases of nephritis was tested by their use as vaccines for patients. The following case-histories and charts illustrate the effects produced:—

CASE 8934.—A male of 31 years was admitted in October, 1919, for general œdema and scanty urine of three weeks' duration; there was no history of preceding illness. Examination showed extensive œdema with ascites and a right hydrothorax. The urine averaged 400 c.cm. per diem; it had a sp. gr. 1028, was acid in reaction, and contained 15 parts per 1000 albumin. The sediment showed abundant casts, many pus cells, and large non-motile bacilli. Injection of this urine was quickly fatal to guinea-pigs.

The patient was placed on the ordinary treatment and his abdomen tapped. During the first month he improved slightly, the amount of urine rising to a daily average of 1000 c.cm. His condition then remained stationary for the next two and a half months (vide Chart 1); the œdema persisted with the same urinary output and an albuminuria of 12 to 16 parts per 1000 (Esbach). Examination of the blood showed no retention of urea.

A vaccine was prepared with considerable difficulty. The large bacilli observed grew unchanged in incubated urine, but on agar lost their staining powers very rapidly. Injections of this vaccine reduced the amount of pus in the urine to a sensible extent, but had no effect on the nephritis beyond reducing the degree of albuminuria to about 12 parts per 1000. The general œdema and quantity of urine excreted were unchanged.

Trial was therefore made of a vaccine prepared from a culture obtained from a case of resolving nephritis in hospital. (No. 11082.) The effect of the first dose of 25 millions was slight, but a second injection of 50 millions was followed by a marked diuresis which persisted until his discharge five weeks later. In the first ten days of this diuresis he lost 21 lb. weight with a rapid disappearance of his ascites and œdema, while the albuminuria fell to the low level of 1·5 parts per 1000. This striking result was closely similar to that reported in a case of syphilitic nephritis under specific treatment about this time.[5] (No. 10774.)

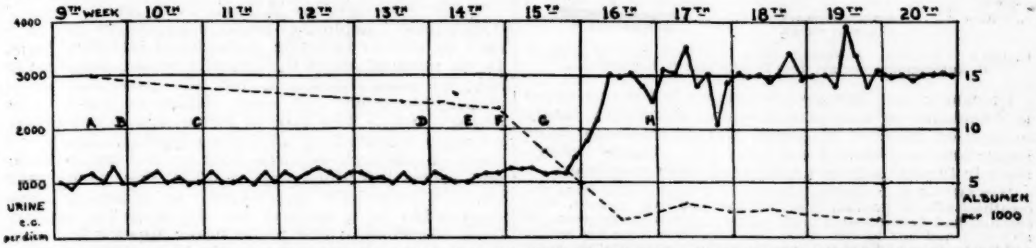

CHART 1.—Case 8934. Chart from ninth week of stay in hospital. The thick continuous line shows the daily excretion of urine; the thin interrupted line the amount of albuminuria. A, Autogenous vaccine No. 1, dose 40 millions; B, 60 millions; C, 100 millions. D, Autogenous vaccine No. 2, dose 20 millions; E, 30 millions. F, Vaccine from Case 11082, dose 25 millions; G, 50 millions; H, 75 millions.

It appears, therefore, that the bacilli so evident in this patient's urine represented an independent infection and had no causal relation to his nephritis. The success of a vaccine prepared from another case of nephritis indicated that there was another bacillus infecting the kidneys allied to this 11082 organism.

CASE 1814.—A boy of 6 years was admitted with ascites and marked dropsy, stated to have been present for ten days only. The heart was slightly dilated, there was some bronchitis and irregular fever. Both the liver and spleen showed a minor degree of chronic enlargement, probably due to Banti's disease, which is very common in Egypt. The boy showed no signs of congenital syphilis. The urine averaged 250 c.cm. per diem; sp. gr. 1020 with 2 parts per 1000 of albumin. Microscopically many casts—blood and cellular—were found with a few bilharzia ova.

On the seventh day after admission he was given a small dose of the 11082 vaccine (10 millions). This was at once followed by an increased output of urine (vide Chart 2), but the diuresis was not

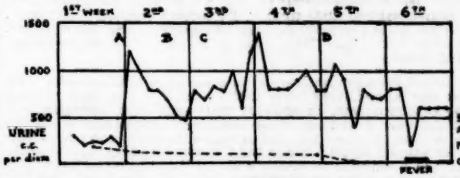

CHART 2.—Case 1814. A, Vaccine from Case 11082, dose 10 millions; B, 12 millions. C, Autogenous vaccine, dose 15 millions; D, 30 millions.

maintained and the œdema showed no sensible diminution in spite of a second dose. Meantime a vaccine had been prepared from a bacillus grown in pure culture from a catheter specimen of his urine of a different type to the 11082 organism. Injection of this autogenous vaccine led to a very rapid disappearance of the extensive œdema and ascites with a loss of 8 lb. in weight. Convalescence was interrupted by a bout of fever for a few days, but was extremely rapid, and he was discharged with urine perfectly free from albumin.

CASE 2021.—A man, aged 25, was admitted for general œdema, which had come on gradually after an attack of fever two months before. His subsequent history shows that this fever was probably malaria. On examination the patient was anæmic (hæmoglobin 50 per cent.); the spleen was palpable and ankylostoma ova were found in his stools. The urine averaged 1000 c.cm. daily, had a sp. gr. 1015, and contained 1 part per 1000 albumin. Microscopically there was an extraordinary number of casts, but no excess of pus corpuscles. He was given oil of chenopodium and received a dose of the 11082 vaccine (50 millions), but then developed intermittent fever. This was found to be malarial and yielded to quinine. Neither the vaccine nor thorough quinine therapy had any effect on the nephritis.

Meantime a culture had been secured from the catheter urine, before the onset of fever, and as soon as the temperature had

settled a small dose of autogenous vaccine (25 millions) was given, but without result (vide Chart 3). Nine days later a larger dose of 100 millions was injected and was immediately provocative of an unmistakable diuresis. Unfortunately, the patient had developed a troublesome diarrhœa, and insisted on his discharge rather than submit to a restricted diet.

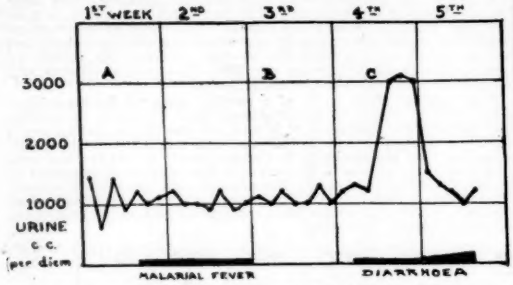

CHART 3.—Case 2021. A, Vaccine from Case 11082, dose 50 millions. B, Autogenous vaccine, dose 25 millions; C, 100 millions.

Of course one case proves nothing, but the course of the nephritis in this patient shows that it can hardly have been malarial in origin, and I confess to being somewhat sceptical of the large rôle assigned to this fever in the ætiology of nephritis in warm countries.

CASE 4397.—A man, aged 24, was admitted for general œdema and breathlessness of gradual onset for the past four months. The swelling had first appeared in the eyelids, then in the scrotum and abdomen, and last in the limbs. On admission there was ascites and the heart was dilated and irregular without murmurs; the blood pressure was unusually low (systolic 97 mm.; diastolic 74). The urine was of high sp. gr. and contained a fair trace of albumin; the daily amount excreted is shown in Chart 4. Microscopically, numerous granular casts were found; cultures were sterile.

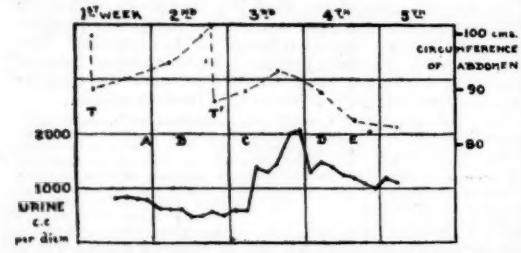

CHART 4.—Case 4397. The continuous line shows the daily excretion of urine; the interrupted line shows the variations in the ascites recorded by measurement of the abdominal circumference. T, Abdomen tapped (8000 c.cm.); T', Second tapping (8500 c.cm.). A, Vaccine from Case 11032, dose 50 millions; B, 100 millions. C, Vaccine from Case 1814, dose 50 millions; D, 80 millions; E, 120 millions.

The patient failed to improve after admission to the wards. His abdomen was tapped and 8 litres withdrawn, but the fluid at once began to reaccumulate, in spite of treatment with digitalin and saline purgatives. Two doses of the 11082 vaccine were administered, but the output of urine fell rather than increased, and the ascites had to be tapped again. Since the temperature had been slightly irregular the possibility of septic endocarditis was considered, but a leucocyte count was normal (8150).

Finally, trial was made of the 1814 vaccine, and the patient immediately responded. In spite of the heat of an Egyptian summer there was a decided diuresis, and the tide of accumulating ascitic fluid was turned. As in the other cases there was no rise of blood pressure, but the heart became regular and smaller in size. The granular casts practically disappeared from the urine, and the patient made a rapid recovery from his very serious condition.

The special interest in this case lies in the effect of one particular vaccine on a case of chronic nephritis with dilated heart, when the urine was sterile. A similar result was obtained in another patient with marked oliguria and dropsy, but without any sign of heart failure and only occasional albuminuria.

Control cases.—To check these results trial was made of these vaccines for cases of chronic cardiac disease and of hepatic cirrhosis with ascites, but in no instance was any diuretic or other effect observed. A vaccine prepared from a Gram-positive bacillus (Case 3360) had no effect on the nephritis of this patient.

Remarks.—The above examples show that the effect of vaccines is specific, and is only obtained when a suitable strain of organism is used. The reaction is usually immediate, but may occur after two or three days' interval. Naturally a great deal more work requires to be done before the best methods of using vaccines can be evolved. But it can be stated that the use of autogenous vaccines is generally indicated since the strains of bacilli isolated show decided differences. Such vaccines, however, may fail in cases complicated by some other infection of the urinary tract, for they may contain few organisms derived from the kidneys. Dr. Clarke has tried plating such cultures on McConkey's medium so as to isolate bacilli of intestinal type. For early use in such cases, and for patients in whom the acute stage is passed and the urine may remain sterile on incubation, stock vaccines are of value. It is proposed to try large doses of detoxicated vaccine made by pooling vaccines prepared from the various strains already isolated and others doubtless to be found in the future.

Discussion of Results.

These investigations indicate that many cases of "idiopathic" nephritis—acute, subacute, or chronic—may be due to infection by bacilli of intestinal types. In its mode of origin the affection would therefore be akin to colon bacilluria, but the particular germs responsible attack the renal epithelium and not the urinary tract. The type of lesion reproduced experimentally is essentially a tubular nephritis. The severe forms of glomerulo-nephritis seen in some specific fevers and septic infections appear often due to pyogenic bacteria (especially streptococci) or other organisms responsible for a septicæmia. But while the bacillary form described in this paper never appears to present the features of a septic nephritis, it can cause hæmorrhage from the kidney.

It is well known that a nephritis once established has a strong tendency to become chronic. The nephritis induced by injection of the bacilli isolated exhibited a similar tendency, although it was rarely possible to recover the germs from the animals infected when the early stage was past. This fact may explain why the urine from cases of chronic parenchymatous nephritis in man is so often sterile. In such cases the acute stage of the infection has passed leaving the kidney severely damaged, its powers of recovery possibly jeopardised by injudicious feeding before the nature of the disease was apparent. The work of Allen on experimental diabetes has shown that, in a dog whose pancreas has been reduced to a minimum, a fatal progressive diabetes may be induced or avoided according to the diet given. Recovery from acute nephritis is probably largely influenced by a suitable diet. On the other hand, in chronic cases a vicious circle may follow the excessive loss of serum albumin in the urine. Hence we should always expect to find germs in the urine of acute nephritis (apart from cases of poisoning), but not necessarily in the chronic stages.

Following the work of Opie and Oertel on the changes produced in the liver as well as in the kidney by the chemical excitants of nephritis, in my later experiments I found the same to hold true of bacillary nephritis. Although this result may seem at variance with our ideas of nephritis it is not opposed to clinical experience. For in the two diseases of man which are invariably associated with nephritis—i.e., eclampsia and infectious jaundice (spirochætosis ictero-hæmorrhagica)—the changes in the liver are notoriously as important as those in the kidneys. And it is an aphorism that in febrile cases with jaundice the urine is albuminous, an observation which illustrates the close relation between these organs both in function and liability to disease.

On this point, as indeed on the others raised, much work remains to be done. But the probability of hepatic lesions being coincident with the renal changes in parenchymatous nephritis should be taken in account in investigating the metabolic disturbances that occur in the disease. It is possible, for instance, that a non-retention of urea may partly depend on a defective formation of this substance by a diseased liver.

Summary.

(*a*) From the urine of patients with "idiopathic" nephritis and from the kidney of a case of fatal nephritis,

bacilli of intestinal types have been isolated in pure culture.

(*b*) Injection of these cultures and subcultures into animals provokes an acute nephritis.

(*c*) From the kidneys of these animals in the earlier stages of nephritis the bacilli injected have been recovered in pure culture.

(*d*) Injections of cultures obtained from animals infected with these bacilli have reproduced the disease in other animals.

(*e*) The nephritis induced runs a somewhat prolonged course, and is accompanied by acute degeneration of liver cells and an enlargement of the spleen in the early stage.

(*f*) In human cases of nephritis treatment with appropriate vaccines has caused rapid amelioration.

(*g*) In some cases of nephritis a secondary or an independent infection of the urinary system may be present and obscure the original cause. This complication is probably more common in Egypt than elsewhere owing to the prevalence of bilharziasis.

In conclusion, it is my pleasant duty to record the valued help of my friend Dr. Clarke, who is responsible for the bacteriological classification and has done much to help the research. My thanks are similarly due to Dr. Yussef Barrada, who secured so many cases of nephritis for my section, and to my house physicians for their care of the patients, collection of urine, and injection of vaccine.

References.—1. Scheidemandel: Münch. med. Woch., 1913, Nos. 60 and 61. 2. Hort: Brit. Med. Jour., October, 1914, p. 713. 3. Opie: Jour. Exper. Med., 1912, vol. xvi. 4. Oertel: THE LANCET, May, 1914, p. 1450. 5. Day: THE LANCET, May, 1920, p. 1009.

THE USELESSNESS OF ANTIMONY IN THE TREATMENT OF FILARIASIS.

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Sir Leonard Rogers[1] has recently reported some observations upon antimony injections given intravenously for the treatment of filariasis, and has pointed out that very careful and prolonged counts are necessary before coming to a conclusion as to the efficacy of this treatment. His results, on the whole, appear to indicate that these injections have a definite effect in greatly reducing the filarial embryos or causing them to disappear from the peripheral blood, presumedly as a result of the destruction of the adult worms.

Recital of a Case.

One of us (G. C. L.) has recently pointed out that for all filarial work, such as estimating embryos, it is essential that measured quantities of blood should be taken, and that before any treatment is commenced the number of embryos occurring regularly in the blood should be known accurately. Variations are not uncommon, and may give rise to false impressions. The drug may act either by killing the embryos or by killing the adults or by killing both. Having had the opportunity of studying a case of filariasis (*F. bancrofti* infection), with plenty of embryos present in the night blood, we gave the patient a series of tartar emetic injections intravenously, and controlled these by nightly examinations of the blood, both before, during, and after the injections, the same measured quantity of blood (20 c.mm.) being taken at the same hour nightly. Dried films were made, the hæmoglobin then being washed out and the film stained with fuchsin. For the determination of death of the embryos wet cover-glass preparations were also employed.

[1] THE LANCET, 1919, ii., 604; Brit. Med. Jour., May 1st, 1920.

History of the case.—Mr. V., a native of India, had lived there all his life till he came to England in July, 1919.

Previous illnesses.—No dysentery, no malaria, no venereal disease.

Present illness.—This began with an abscess on the inner side of the left thigh over the adductor tubercle ten years ago. *F. bancrofti* embryos were found in his night blood then. Six years ago he had another abscess, this time in the left groin; it was deep and was operated on and drained. In 1914 an abscess developed in the scrotum. After that the scrotum began to enlarge, the enlargement being of an intermittent nature and sometimes disappearing entirely. The attacks of enlargement were accompanied by pain, fever, and general malaise. Finally, the condition passed into a permanent one and definite elephantiasis supervened. The patient saw Sir James Cantlie on coming to London in 1919. The latter operated upon him, removing the elephantoid scrotum with successful results. Since then the patient has been living in England and has suffered from no further febrile attacks.

Examination.—Teeth had all been taken out for pyorrhœa. Heart and lungs normal. Urine: No albumin, blood, or sugar.

Filarial condition.—Has had an elephantiasis of scrotum, successfully operated on. Penis also slightly affected. Deep scar in left groin, also another on inner side of left thigh. Glands enlarged just below Poupart's ligament on left side. Elsewhere no enlargement.

Blood.—A fair number of *Filaria bancrofti* embryos in night blood; definite nocturnal periodicity.

Injections and Filarial Counts.

Tartar emetic injections were given intravenously in the usual manner, commencing with ½ gr. and increasing by a ½ gr. each time till 2½ gr. was reached, a total of 17½ gr. in all being given. The patient bore these very well without ill-effects.

The following table gives the details of the filarial counts and the injections:—

(A) Number of filarial embryos in 20 c.mm. blood.
(B) Number of grains of A.T. injected.

Date. 1920.	Hour P.M.	(A)	(B)	Date. 1920.	Hour P.M.	(A)	(B)	Date. 1920.	Hour P.M.	(A)	(B)
June 21	11.55	15	—	July 10	11.55	15	—	July 27	—	20	—
,, 22	,,	17	—	,, 11	,,	18	—	,, 28	—	17	—
,, 23	,,	15	—	,, 12	4	—	1½	,, 29	4	—	2½
,, 24	3	0	—		11.55	6	—		11.55	22	—
	11.55	13	—	,, 13	,,	18	—	,, 30	,,	20	—
,, 25	,,	16	—	,, 14	,,	16	—	,, 31	,,	18	—
,, 26	,,	14	—	,, 15	4	—	2	Aug. 1	,,	20	—
,, 27	,,	10	—		11.55	9	—	,, 2	4	—	2½
,, 28	3	0	—	,, 16	,,	18	—		11.55	23	—
	11.55	21	—	,, 17	,,	22	—	,, 3	,,	19	—
,, 29	,,	16	—	,, 18	,,	28	—	,, 4	,,	17	—
,, 30	,,	12	—	,, 19	4	—	2½	,, 5	,,	7	—
July 1	,,	14	—		11.55	10	—	,, 6	,,	10	—
,, 2	,,	20	—	,, 20	,,	22	—	,, 7	,,	14	—
,, 3	,,	15	—	,, 21	,,	24	—	,, 8	,,	19	—
,, 4	,,	25	—	,, 22	4	—	2½	,, 9	,,	16	—
,, 5	4	—	½		11.55	10	—	,, 10	,,	10	—
	11.55	15	—	,, 23	,,	18	—	,, 11	,,	17	—
,, 6	—	15	—	,, 24	,,	20	—	,, 12	,,	10	—
,, 7	—	32	—	,, 25	,,	25	—	,, 13	,,	14	—
,, 8	4	—	1	,, 26	4	—	2½	,, 14	,,	15	—
	11.55	4	—		11.55	15	—	,, 15	,,	22	—
,, 9	,,	12	—								

* It was decided at this date to stop the injections as they were doing no good.

Discussion of Results.

A perusal of the above table shows that the injections, consisting of a total of 17½ gr. of tartar emetic, had no effect upon the infection at all, the adult worms not being killed and going on pouring embryos into the blood as before. The embryos were not all killed either as, even though reduced in numbers as on the night after the injections, those present were alive and healthy.

The only feature worthy of note is, that at first there were fewer embryos in the sample of blood taken on the night of the injections which were given at 4 P.M. This is not surprising when one considers that they would be in the lungs at that time and that the antimony would come in direct contact with them in a concentrated solution. That there was no effect upon the adults is shown by the numbers being up to normal the next evening and afterwards. Further, towards the end of the injections, even although the large dose of 2½ gr. was being given, this temporary disappearance was no longer noticeable, the number found on the same evening as the injections being up to the average, or even a little above. The table illustrates also the considerable constancy, in this individual case, of the number of embryos in the blood every evening. If the female worms constantly pour young into the blood, then there must be a corresponding destruction going on, to keep the numbers at this mean rate. Possibly on the days when over 20

embryos per slide were found there may have been an increased out-pouring from the female; or, of course, there may have been several females present giving birth to embryos intermittently.

It would appear, therefore, that antimony is not to prove a specific for filariasis as it is for bilharzial infections, but the only way finally to decide this point is to follow up cases, as has been done above, all results being checked by careful enumerations of the embryos. We have to thank Sir James Cantlie for letting us test the efficacy of the injections in this case.

NOTES ON THE

TREATMENT OF RECURRENT MALARIA BY NOVARSENOBENZOL.

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So much has already been written as to the nature of malaria, the clinical and other characters of the disease, and the lines of treatment found to be most successful, that I propose here only to touch on a series of cases of recurrent malaria treated by me at the 3rd London General Hospital, Wandsworth, by intramuscular injections of novarsenobenzol (neokharsivan). Having seen during the last three years at least 500 cases of recurrent malaria from all parts of the world, I was struck by the fact that in all these cases the usual varieties of routine quinine treatment (i.e., by the mouth, intramuscular and intravenous) had been tried, in many cases pushed so far as to produce temporary blindness and deafness, and yet upon arrival in England the patients were still suffering from the disease, as shown by blood smears and a differential count. I therefore decided to venture on another line of treatment.

Rationale of Treatment.

My reasons for using novarsenobenzol were: 1. Because it has been conclusively proved that the malarial fevers are protozoal infections, infecting the red corpuscles of mammals, reptiles, and birds. 2. Because the organic compounds of arsenic in its trivalent form are more potent in action upon protozoa. 3. Because it is known to destroy the *Spirochæta pallida*, the balance of opinion now being distinctly in favour of the *Spirochæta pallida* being a protozoon.[1]

The reason why the spirochætes vanish so quickly after salvarsan, or neokharsivan, is that they contain free OH groups, since in their colloidal lipoid membrane an unsaturated fatty acid exists. It is to these OH groups that the metals become attached, with the result that the organisms perish. I therefore hoped the same result might take place with the malarial parasite.

The preparation used was novarsenobenzol (B. W. and Co.), which is easily soluble in water, yielding a neutral solution suitable for intramuscular or intravenous injection. The first two injections consisted of 0·3 g. in 5 c.cm. 0·5 per cent. sterile saline, and the last two injections of 0·4 g. in 7 c.cm. 0·5 per cent. sterile saline. These injections are given at intervals of one week. A line is drawn backwards from the anterior superior iliac spine to the top of the natal fold; this line is divided into three equal parts; the point of intersection of the upper and middle third is the site of injection. All the usual antiseptic precautions should be taken with regard to the sterilisation of needles and syringe. The night before treatment the patient is given a laxative, the following morning, three hours before the injection, he is given a light breakfast, and the food on that day should be light so as to throw as little strain as possible on the digestive organs during the elimination of arsenic. The patient should stay in bed for at least three hours after the injection, and in order to prevent any after-pains or reactive painful infiltration hydropathic measures such as moist compresses, hip-baths, or the application of a hot-water bottle may be employed.

If the pain is very severe I give the following powder, which I find efficacious: Pyramidon, 10 gr.; medinal, 3 gr.; heroin hydrochlor., 1/12 gr. In between the injections he is kept on mist. malaria (contains 2½ gr. quin.).

[1] Muir and Ritchie: Manual of Bacteriology, edition 1919, p. 506.

In all cases an examination of the blood is made before each injection with regard to the presence of the malarial parasite, and a differential blood count to ascertain especially any increase of the large mononuclears. This is a very important feature, as in cases where the parasite cannot be demonstrated in the blood the mononuclear reaction, along with the presence of pigment in the mononuclear cells (due to phagocytosis of pigment formed by the parasites), has been taken as evidence that the case is one of malaria. The mononuclear reaction is especially interesting from the fact that in other protozoal diseases an activity of the same elements has been observed.

Notes on Cases.

The following cases were all treated by intramuscular injections.

CASE 1.—Capt. E., R.A.M.C.(T.), the first patient of the series, was suffering from malignant malaria, contracted in Palestine, which produced pyrexial relapses every fortnight in spite of 14 intramuscular injections of quinine, and 45 gr. or more by the mouth daily for a month, followed by 30 gr. for three months. The cachexia, anæmia, and myocarditis served to emphasise the inadequacy of quinine. The effect of neokharsivan injections was to extend the fortnightly periodicity of relapses to an interval of two months in the first series, and to six months for the second series of injections.

Treatment started on May 19th, 1919. Patient left hospital on Sept. 19th, 1919; reported no lapse in December, 1919, and up to date (July, 1920) reports no recurrence. This patient had four intramuscular injections and one intravenous. He was hypersensitive to arsenic and developed a rash and acute asthmatic symptoms.

CASE 2.—Lieut. B., age 36. Type, M.T. Previous attacks 21. Five injections from July 24th to August 26th, 1919. Left hospital well. Reported Oct. 29th, 1919. No relapse.

CASE 3.—Lieut. P. Type B.T. Four injections. No malaria parasites present upon discharge. An acute attack of exfoliative dermatitis after last injection.

CASE 4.—Lieut. E. Type B.T. Sept. 18th, 1919, four injections. Left hospital Dec. 19th quite well.

CASE 5.—Capt. S. Type B.T. Four injections Sept. 18th, 1919. Left hospital Dec. 19th, 1919, quite well. Reported Feb. 7th, 1920. No relapse.

CASE 6.—Lieut. L. Type B.T. Five injections. Discharged quite well Oct. 5th, 1919.

CASE 7.—Lieut. A. Type M.T. Ten previous attacks occurring every two weeks. Four injections. Discharged quite well, December 1919. First injection Oct. 14th, 1919. Reported hospital Feb. 20th 1920. Very well. No relapse.

CASE 8.—Capt. M., R.A.M.C. Type M.T. Four injections. Discharged quite well Oct. 8th, 1919.

CASE 9.—Lieut. B. Oct. 31st. Type M.T., contracted in Macedonia. Fifty-four attacks. Spleen enlarged, tender. Four injections. Left quite free Dec. 20th, 1919.

CASE 10.—Lieut. B. Type B.T. First injection, Nov. 11th, 1919; fourth injection, Dec. 3rd, 1919. Left hospital free. Reported hospital March 25th, 1920. No attacks for over four months.

CASE 11.—Lieut. D., R.A.F. Type B.T. Four injections. Left hospital Feb. 25th, 1920, quite well. Seen in June, 1920. No recurrence.

CASE 12.—Lieut. W., R.A.F. Type B.T. First attack in Persia, 1916; since 14. Completed course, four injections. Discharged quite well Jan. 19th, 1920.

CASE 13.—Lieut. J., 31st Punjabis. Type B.T. First attack India, 1916; since ten. Four injections December, 1919. Pathological laboratory report: No parasites present.

CASE 14.—Lieut. F., R.F.A. Type B.T. First attack Batoum, 1919; since 3. November, 1919, four injections. Discharged free Jan 26th, 1920.

CASE 15.—Capt. P., 2nd Glosters. Type M.T. First attack, 1917; since 12. Four injections. Discharged free Feb. 18th, 1920.

CASE 16.—Lieut. B., R.F.A. Type B.T. First attack Baku, 1919. Four injections. Discharged free.

CASE 17.—Lieut. F., R.A.F. Type B.T. First attack India, 1919; since 4. December, 1919, four injections. Reported hospital Feb. 7th, 1920. Quite free.

CASE 18.—Lieut. W., aged 24. Type M.T. Dec. 17th, 1919. M.T. parasites present. No history of malaria. Symptoms very pronounced—malaria, cachexia, anæmia, jaundice, vomiting. Urine bile-stained. Fæces normal in colour. Constipated. Dec. 17th temp. 104°F. First injection 0·3 g. N.K. Dec. 18th temp. normal. Patient feels better; jaundice commenced to disappear; and patient made uninterrupted progress. Discharged Jan. 28th, 1920, free and well. March 30th, 1920, reported at hospital; no recurrence. Feels quite well; weighs 13 stone.

CASE 19.—Major D., aged 35. First attack September, 1919. Type M.T. This was the most difficult case of all to deal with. Had nine intramuscular injections, one intravenous. Left hospital on May, 1920. Pathological laboratory report: No M.T. present.

CASE 20.—Capt. P. Type B.T. Jan. 3rd, 1920, first injection completed. Course of four. Feb. 21st, 1920, reports no recurrence.

Conclusion.

It will be noticed that in the 20 cases here reported 12 were Type B.T. and 8 Type M.T., none of which have reported a recurrence. To the above-mentioned I can add another 18 cases, of which I have

notes, thus making 38 cases in all. I may say that only three patients have reported "they think they have had a slight attack" since leaving hospital.

Personally I am very gratified with the results and regret I did not keep more records. In cases where it is doubtful if the malarial parasite exists in the blood I have tried a provocative dose, and in several cases the desired result has been obtained. I would suggest that even two weeks after the blood gave a negative to M.T. or B.T. parasite, a mild provocative dose be given to ascertain whether a cure has been effected. If the disease is found to be latent a second course lasting another four weeks would be suggested.

In conclusion, I have to thank Major Essex Wynter, R.A.M.C. (T.), for permission to publish these notes; Captain W. L. Harrison, R.A.M.C. (T.), for his invaluable assistance in working out the pathological reports, especially as to the differential counts *re* large mononuclears; and Charge-Sister Brookes for her attention to the details regarding the preparation and after-care of the patients, the taking of temperatures, and valuable assistance given me in administering the injections.

A CASE OF

ACUTE ENCEPHALITIS LETHARGICA

FOLLOWED BY MYOCLONIC MOVEMENTS.

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THE following case has certain points in common with the three cases of the myoclonic form of acute epidemic encephalitis described by Dr. Arthur W. M. Ellis in THE LANCET of July 17th. The muscular spasms, however, in my case were a late sequela of the lethargic state, and instead of the shock-like contractions of the abdominal muscles with delirium and insomnia noted by Dr. Ellis, there was general muscular rigidity associated with drowsiness and coma; delirium and insomnia were minor features. The history of the case was obtained after the patient had recovered.

History of the Case.

Pte. J. went to Salonika in November, 1915. First attack of malaria in the summer of 1916; numerous relapses during 1916, 1917, and 1918. Since returning to England has had slight shivers and headache; last relapse in October, 1919.

Admitted to the Royal Herbert Hospital on Nov. 12th, 1919. Somewhat confused in mind; states he has had malaria. Lies with eyes shut, showing no interest in his surroundings, but answers when spoken to. Temperature 100° F.; pulse 84, good volume. Blood examination: No malaria parasites found.

Nov. 13th, 1919: Patient is dull and lethargic; has incontinence of urine and fæces. T. 99·4°. P. 94. R. 36.

14th: Delirious and violent during the night; tried to get out of bed; very little sleep; quiet this morning; holds himself very stiff in bed, muscles of back being specially rigid; no vomiting; a few râles at base of right lung. It is impossible to palpate the spleen on account of the abdominal rigidity. T. 100°. P. 102. R. 36.

15th: No improvement. T. 99·4°. P. 86. R. 36.

16th: Still very stuporose; incontinent. 12 noon: Gave rectal saline 8 oz., with quinine sulph. 20 gr. 5 P.M.: Nearly comatose; very rigid; conjunctival reflex extremely sluggish. Gave intravenous injection of quinine bihyd. 40 gr. in 8 oz. of normal saline at a temperature of 110° F.

17th: Patient has greatly improved; speaks intelligently. T. 101·4°. P. 100. R. 36. Lumbar puncture attempted; no fluid withdrawn, patient too rigid for puncture without anæsthetic, and too ill to be anæsthetised to requisite depth. Blood culture negative after five days' incubation. Blood count: Total leucocytes, 9320 per c.mm. Differential count, neutrophil polymorphs, 83 per cent.; small lymphocytes, 7 per cent.; large lymphocytes, 5·5 per cent.; large hyalines, 2·5 per cent.; transitionals, 1·5 per cent.; basophils, 0·5 per cent.; eosinophils, 0 per cent. Urine: No albumin or sugar. Treatment: Rectal quinine 20 gr. night and morning, to be continued daily.

18th: More drowsy this morning. T. 100°. P. 106. R. 38. Case diagnosed as acute lethargic encephalitis by Dr. Newton Pitt, consulting neurologist to the hospital.

19th: Slightly improved. For the first time asked for and used the urinal instead of passing his water into the bed; no incontinence of fæces now. T. 101·2°. P. 120. R. 40.

20th: Continued improvement; less lethargic, although he is still very rigid. T. 100·2°. P. 114. R. 38.

21st: Patient is very much worse this morning; nearly comatose, can only just manage to put out his tongue, which is dry and covered with thick brown fur; muscles of back, abdomen, and limbs very rigid; has incontinence of urine and fæces. Rectal quinine saline not retained. T. 99·2°. P. 112. R. 88. Although we had decided that the patient was not suffering from cerebral malaria, his condition was such that I resolved to repeat the intravenous injection of quinine. I was guided in this by the quite remarkable improvement which had apparently resulted from the intravenous injection on the 16/11/19. Therefore, at 3 P.M., I gave him an intravenous injection of quinine, 40 gr. in 8 oz. of saline, as well as an intramuscular of 20 gr. I also ordered a rectal saline with quinine 20 gr. to be given at 11 P.M. At 10 P.M. the temperature had dropped to 97° F., P. 108, R. 40, and the patient appeared to be slightly better. 11 P.M.: Rectal quinine saline given but not retained.

22nd: Considerable improvement; much less rigidity of muscles; less drowsy; is more intelligent and understands what is said to him; on request made an attempt to whistle; no facial paralysis, ptosis, strabismus, or nystagmus, but states he sees double. T. 98·4°. P. 96. R. 38. 11 A.M.: Intravenous quinine, 40 gr. in 8 oz. of saline. Intramuscular quinine, 20 gr. Tongue is still very dry and furred. 6 P.M.: Can move legs and arms freely; reflexes are normal, but still has rigidity of abdominal muscles and incontinence of urine and fæces. 11 P.M.: Retained rectal injection of quinine 20 gr.

23rd: Improvement maintained; can put out tongue without difficulty; organ dry and furred; is quite intelligent; got out of bed this morning, took some grapes from his locker and ate them; read his letters. Abdominal muscles remain rigid, but general rigidity has passed off; still has incontinence and diplopia. T. 98·6°. P. 80. R. 36. Treatment: Intramuscular quinine, 20 gr., into each buttock. 6 P.M.: Rectal quinine, 20 gr.—retained. 11 P.M.: Rectal quinine, 20 gr.—not retained.

24th: Only slightly drowsy; speaks intelligently but slurs his words; sits up in bed when asked to; tongue furred but moist. T. 99°. P. 100. R. 36. 11 A.M.: Intravenous quinine, 30 gr. Intramuscular quinine, 20 gr. 6 P.M.: Rectal quinine, 20 gr.—retained. 11 P.M.: Rectal quininine, 20 gr.—not retained.

25th: Patient is making rapid strides towards convalescence. T. 99°. P. 86. R. 28. Says he is hungry and asks for food; sits up in bed smoking cigarettes; mentally clear; no sign of drowsiness; tongue quite moist and only furred on the posterior half. During the night, for the first time, he had no incontinence of urine. Throughout his illness he has been very constipated, and when he did pass a motion it was into the bed. On one or two occasions during his more lucid intervals he asked for the bedpan, but was unable to use it in time; has no incontinence of fæces now. Rectal quinine saline given t.d.s. and retained.

26th: Continued improvement. Second leucocyte count: Total whites, 20,400 per c.mm. Differential count: Neutrophil polymorphs, 68 per cent.; small lymphocytes, 16 per cent.; large lymphocytes, 13 per cent.; hyalines, 3 per cent. Quinine treatment stopped.

27th: Patient is better, but he has developed peculiar rhythmical movements of the right arm and leg; the finger movements have a strong resemblance to the athetosis of paralysis agitans; the arm and leg movements are choreiform in character.

Dec. 5th: During the past 10 days the patient's condition has greatly improved; speech is more distinct, and diplopia is no longer complained of. He has had slight irregular rises of temperature—99°. P. 98. R. 26. The arm and leg movements are worse, if anything, and he has sudden jerky spasms, due to contraction of the flexors of the limbs. He is able to feed himself, but very often an involuntary spasm of the muscles of the arm jerks the food he is carrying to his mouth over his shoulder or on to the floor. The mental state has improved, but he is depressed, very irritable at times, and difficult to nurse.

23rd: His general condition shows steady improvement; the temperature has been normal for a fortnight; there has been no return of the lethargic condition, but the rhythmical movements with sudden spasms are as bad as ever. There has been no diplopia or other sign of paresis of the ocular muscles since; his speech is more distinct and less slurring in character, but he is still depressed, irritable, and sleeps badly. He insulted the sister in charge of the ward this morning, and his behaviour at meals, on account of the unfortunate manner he has of jerking his food all over the table, has made him very unpopular with the other patients. Transferred to observation ward for mental cases. The report on blood taken for a Wassermann test is negative. Treatment: Pot. brom. 20 gr. t.d.s. and massage.

July 27th, 1920: Patient left this hospital six months ago, but I was fortunate enough to see him again to-day. He has almost recovered, and is able to go about London by himself. His mental condition is quite normal. His articulation is not absolutely clear yet, and he still has an occasional twitch of the right arm. He states that the twitching gets worse when he becomes over-tired. He sleeps, eats, and looks well.

I took the opportunity to have his eyes examined by the hospital ophthalmologist, who reports as follows: "Pupils react normally to light and accommodation; tension normal; convergence perfect; no abnormality of ocular muscles; says he has had diplopia, but not now. I am unable to find anything abnormal in the eyes."

Remarks.

Unfortunately I have no notes of the actual onset of disease except that the patient was taken ill at the Crystal Palace and that he had had malaria; there was no history of vomiting obtainable. The fever was of a mild type, but the pulse and respirations were rapid and continued so for months. No record was made of the condition of the pupils, although diplopia was noted. The speech was indistinct and slurring, and is still, after eight months, not quite clear. There was obstinate constipation and, after purgatives, incontinence of fæces. He had incontinence of urine for the first fortnight after admission; the urine showed no abnormality. The leucocyte counts are interesting. On Nov. 17th, 1919, there was a relative increase of neutrophil polymorphs, and the total count was more or less normal. Nine days later, when the patient was well on the road to recovery, the total number of leucocytes had risen to 20,400 per c.mm., the polymorphs had

fallen to normal, while the large lymphocytes had increased from 5·5 per cent. to 13 per cent. The latter rather points to malaria as a factor in the case. It was unfortunate that because of the rigidity of the muscles of the back and the fact that he took the anæsthetic so badly we were unable to obtain a specimen of his spinal fluid for examination; the Wassermann test on the blood was negative. The patient was delirious and violent on the third night after admission. His principal symptom was drowsiness; this deepened into coma on the fourth day, and after an interval of consciousness he again became comatose on the ninth day. Another marked feature was the rigidity, especially of the muscles of the back and of the abdominal wall. It is interesting to note that the abdomen remained rigid for some days after the general stiffness had disappeared.

As regards treatment, although parasites had not been found in his blood the treatment was carried out in accordance with the rule that all persons who have resided in a malarial district and suddenly become comatose should be treated with large doses of quinine by the intravenous and intramuscular or rectal routes.[1]

The end in this case appears to have justified the means, and was characterised by a rapid return to consciousness after the initial coma on Nov. 16th, 1919, and again after the relapse on the 21st. I do not, of course, suggest that the recovery of this patient was due to the treatment he received, but the speedy manner in which he seemed to react to the intravenous injection of quinine gives food for thought.

The case may have been one of cerebral malaria—the history and second differential leucocyte count are in favour of this. On the other hand, it may have been some form of encephalitis—the rigidity of the muscles in the acute stage, the lethargy, the mental condition, the diplopia, the myoclonic movements in the later stages, and the first leucocyte count would appear to justify this diagnosis.

Clinically, apart from the result of the treatment, the case certainly did not conform to the type of cerebral malaria we saw in Macedonia.

Of the sequelæ the mental condition, the rhythmical movements, the sudden muscular spasms, the pill-rolling movements of the fingers and thumb, the absence of paralysis, the report on the condition of the eyes by the hospital ophthalmologist, and the slow but steady recovery of the patient should be noted.

THREE CASES OF ARTHROPLASTY.

BY C. D'OYLY GRANGE, O.B.E., M.B., F.R.C.S.ENG.,
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THE following cases of arthroplasty following gunshot wounds of joints are described, as few similar cases seem to have been recorded, and they show that the limbs can be greatly improved by such operations.

1. *Gunshot wound of left buttock followed by dislocation of hip, with ankylosis.*—Pensioner J. T. was admitted to the Northumberland War Hospital in October, 1916, having been wounded more than a year previously. His chief wound was in the left buttock, the posterior lip of the acetabulum having been destroyed, and this had allowed of dislocation of the head of the femur on to the dorsum ilii. Here bony ankylosis had taken place with internal rotation of the thigh. The sciatic nerve had been partially injured. Drop-foot was present, and there were trophic sores on the toes. The right knee was ankylosed. When admitted there were several sequestra in the left ilium, and these were first removed. The wounds took a considerable time to heal, and the operation of arthroplasty had to be delayed owing to the fact that the trophic sores on the toes caused repeated attacks of inflammation in the skin and subcutaneous tissue of the leg and thigh. It would have been better if the foot had been amputated at this stage, as it had to be done later.

Operation.—On Oct. 6th, 1917, arthroplasty was performed, the neck of the femur being divided and a false joint made between the neck and head of the femur in the following manner. The patient lay slightly on his right side, with a sand-bag under the left buttock. A curved incision was made midway between the crest of the ilium and the great trochanter. The muscles were divided in the line of this incision until the neck and the head of the femur were laid bare. The head was firmly ankylosed on to the ilium. The tissues were freed from the neck, and it was then divided by a Gigli saw close to the head in an oblique direction, the line sloping from above downwards and inwards. The lower part of the head was now cut away with a chisel and the upper part hollowed out to form a cup, into which the neck fitted after the edges had been rounded off. A flap of gluteus medius was then sutured over the raw end of the neck and a loose flap of fat from the buttock was placed in the cup in the head of the femur. The neck fitted quite well into this cup, and when the gluteus medius and minimus had been sutured there was no tendency for it to become displaced. The wound was completely sutured and a Liston splint with weight extension was applied for two weeks. Healing was slightly delayed by the presence of a hæmatoma, which would have been avoided by the use of a small drain; but in spite of this the patient very quickly began to move his limb and to sit up in bed, and within two months he could flex his hip to a right angle. The condition of his foot did not improve, and accordingly a Syme's amputation was done in March, 1918. This, however, allowed of the fitting of an artificial limb, with the result that the left leg was equal to the right in length, and he began to walk. When seen in January, 1919, he could flex the left hip to a right angle, and stated that with his artificial leg he could walk seven miles. He considered the left leg better than the right, owing to the ankylosis of the knee on that side.

This operation is a little more difficult when the head of the femur is ankylosed in the acetabulum because the neck is deeper. Murphy's method of sawing off the great trochanter might be easier, but I have not tried it.

2. *Gunshot wound of right shoulder followed by ankylosis.*—The patient, Corpl. M. M., was wounded by shell in March, 1916, and was admitted to the Northumberland War Hospital in April. Several pieces of metal had entered his right shoulder from above, causing a large flesh wound, fracturing the clavicle and the acromion, and passing down into the head of the humerus and into the arm. In May several loose pieces of bone and some pieces of metal were removed from the head of the humerus, and the cavity was filled with B.I.P.P., but the wound did not heal. In August the B.I.P.P. and some sequestra were removed, and a long tract was found passing four inches down the humerus. Stereoskiagrams revealed a piece of metal embedded in the bone, and this was removed through an incision posteriorly. The wound then healed. The result was ankylosis of the shoulder-joint in a slightly abducted position, with a good deal of destruction of the head and great tuberosity; the fractures of acromion and clavicle united, and there was a good deal of scar tissue above the shoulder where the skin wounds had closed. The condition of the patient was not good, he was very anæmic and thin, so nothing surgical was done for some time. He found the arm of very little use to him, as with scapular movement he could only abduct it 30°. This movement was probably limited owing to the injury to the outer end of the clavicle, and consequent limitation of movement of the acromio-clavicular joint. Flexion of the arm was almost nil and there was no rotation.

Operation.—On April 14th, 1917, arthroplasty was performed.* An incision was made along the lower border of the clavicle and down the front of the arm for three inches, another was made just below the acromion process to meet the first incision, and a third was made along the lower border of the pectoralis major; this last, with the clavicular part of the first, allowed the flaps of fascia to be taken off the pectoralis major. The pectoralis major was divided where it crosses the axilla, and the anterior half of the deltoid was also cut through half an inch below the acromion process and turned down. This exposed the short head of the biceps and coracobrachialis arising from the coracoid process; these were divided, as was also the pectoralis minor. The vessels and nerves were pushed downwards and inwards, the subscapularis was exposed and divided, and the head of the humerus thoroughly exposed. There had been a good deal of destruction of the head and a considerable amount of outgrowth of bone, with the result that the head of the humerus was very irregular in outline, and considerable difficulty was experienced in freeing the capsule and muscles on the posterior surface. When this was done a large joiner's chisel was used and the humerus was separated from the body of the scapula as near the joint line as possible, but a part of the axillary border of the scapula came away with the humerus, and it had to be excised. The head of the humerus was rounded off as much as possible and the glenoid smoothed down, and then a large flap of superficial fascia was turned in from the surface of the pectoralis major. The flap was hinged externally by two pedicles, which allowed of the muscles being sutured between them. The subscapularis muscle was then sutured, followed by the coracobrachialis, short head of the biceps and pectoralis minor, and, lastly, the deltoid and pectoralis major. The long tendon of the biceps must have been destroyed during the earlier months of suppuration, for it was not present over the upper part of the humerus. The wound was closed and the arm put up with the shoulder abducted 45°. There was considerable oozing during the whole operation and for several days after; the patient always bled freely. A small part of the pectoral flap, being very thin, sloughed, and a sinus remained over the head of the humerus. After repeated skiagrams and examinations with a probe, with negative results, the sinus was opened up and a sequestrum was removed. It was evidently one of the chips from the head of the humerus which had been overlooked, and after its removal the wound healed. The result of the operation, considering the amount of damage done by the wound, was good. Active abduction to 45° and flexion to 45° could easily be obtained quite painlessly, together with 60° of rotation. Passive flexion and abduction could be obtained to 90°.

3. *Gunshot wound of right elbow followed by ankylosis.*—Pte. F. D. was admitted in April, 1918, having received several wounds on the outer side of the arm and forearm about ten days previously, one of which opened up the elbow-joint. The wounds were dressed with B.I.P.P. and healed in eight weeks, but complete ankylosis of the elbow at an angle of 90° resulted, without, however, any loss of bone. The arm was treated with radiant heat and massage for two months, and then arthroplasty was done on Sept. 3rd.

Operation.—An incision 4 inches long was made on the outer and one on the inner side of the joint, and these were joined by a transverse incision across the arm above the olecranon. The ulnar nerve was dissected out and retracted inwards to avoid any

[1] Alport: Malaria and its Treatment, p. 56.

injury, the triceps muscle was divided transversely an inch above the olecranon, and the humerus exposed. The triceps was dissected down, both internal and external lateral ligaments were divided, and the olecranon and head of the radius exposed. A half-inch chisel was driven in, first on one side and then on the other, between the olecranon and radius on the one hand and the humerus on the other, keeping as close to the line of ankylosis as possible. The radius was easily separated by this means, but the ulnar was fixed by the ankylosis of the coronoid process and humerus; this was readily broken through by flexing the forearm. The surfaces of the bones were now very like the surfaces of the normal bones in shape, but very rough. They were smoothed down as much as possible, and made to fit and move easily the one on the other. The ankylosis between radius and ulnar was only fibrous and was cut through. A flap of fat from the posterior surface of the triceps was then turned into the joint and sutured to the anterior capsule, a piece of Cargile membrane being placed on each side of the flap. The triceps was sutured together and the skin closed, the arm being put up at right angles. Gentle movement was started in ten days' time, but it was painful. Massage was commenced at the end of three weeks.

The patient was discharged in January, 1919, his movements being flexion 30° beyond a right angle and extension 45° from a right angle. Pronation and supination were disappointing, as it only amounted to about 30°. Flexion and extension were very powerful movements, as he had full use of his biceps and triceps, and there was no lateral movement at the joint owing to the preservation of the original contour of the bones. The amount of movement obtained might have been improved by the excision of more bone, but I think the joint would have been less secure and the power of movement lessened.

Conclusions.

The operations have little risk, and the benefit in each case was considerable. The joints were very strong and there was no tendency to dislocation or to abnormal movement, as the chief ligaments remained.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF PURPURA FACTITIA.

By KATHLEEN M. MCKEOWN, M.B., B.S. LOND.,
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THE following case is a typical instance of hysterical deception, confirmed by the confession of the patient.

A girl of 13 was admitted to hospital on April 22nd, 1920, for "purpura," when she gave the following history. On April 17th she had not felt well, had vomited once, and had complained of pains in both arms not limited to the joints. She stated that large purple patches, not painful on pressure, had appeared all over her arms and legs on the same evening, and that her elder sister had had similar patches all over her body some years before. No history of rheumatism was obtained. The patient belonged to people in extremely poor circumstances and was rather hysterical in type. Since March 3rd she had attended the hospital as an out-patient as she had fallen down a flight of stairs, and she was about to be discharged on April 17th.

Condition on admission.—Temperature, pulse, and respiration normal. On examination there were seven large "purpuric" patches, varying in size but not in shape, on the flexor surfaces of both arms and forearms, with three similar patches on legs. The highest patch on the right side was on a level with the tip of the acromion process. The patches on the legs were on the inner and outer surfaces midway between the knee and ankle. The patches consisted of numerous minute hæmorrhagic spots and petechiæ set closely together and presenting a definite grouping. There was an outer band representing the outline of an oval and two straight lines somewhat broken running along the long axis. All the patches with the exception of two were oval, measured 2 in. by 1 in., and were very sharply defined. The two exceptions were on the arms and were linear, starting on the extensor surface and coming round to the flexor surface. The rest of the physical examination was negative.

At a first glance purpura was suggested, but a suspicion of self-infliction was aroused by the similarity in shape and size of the majority of the patches, the curious shape, the position and distribution, and lastly, the absence of any purpuric manifestation elsewhere.

During the first examination it was easily shown that all the marks occurred on places accessible to the patient's mouth, and later we were able to prove experimentally that similar patches could be produced by taking hold of a piece of skin with the teeth and then applying strong suction with the lips. The existing patches were ringed with silver nitrate, and the patient was given ample opportunities for producing fresh ones, but none appeared. After three days the patches became brown in colour and faded in a week.

A CASE OF BLACKWATER FEVER; RECOVERY.

By EDWARD F. GREENE, M.R.C.S., L.R.C.P. LOND.,
HONORARY CAPTAIN, R.A.M.C.

THE following details of treatment of a case of blackwater fever, which proved to be very satisfactory, appear interesting enough to warrant publication. The patient came on board the s.s. *Zaria*, West African mail boat, at Duala on July 14th, 1920, and was perfectly well up to 11 P.M. on July 22nd. On July 23rd at 1 A.M. he was taken ill, the symptoms beginning with epigastric pain, sickness, and the passing of coffee-coloured urine. The patient stated that two men employed at the same factory as himself had recently died of blackwater fever.

Course of the disease and treatment:—

July 23rd: 8 A.M., temp. 105·5° F. (phenacetin, gr. x.), water dark brown, one quarter albumin. Half a pint of hot water with one teaspoonful of salt given every half hour, 10 gr. of phenacetin every two hours. A hypodermic injection of hyd. perchor., 1 in 1000 (10 minim dose), given at 9 A.M.; temp. 9 P.M., 102·5°.

July 24th: Water slightly lighter, but redder, albumin one quarter; 10 A.M., temp. 99·5°.

July 25th: 9 A.M., temp. 102·5°. Inject. hyd. perchlor., 1 in 1000 (m x.), temp., 9 P.M., 99·8°.

July 26th: Temp. 102°. Repeat injection of hyd. perchlor. and saline solution being given continuously throughout. 9 P.M., temp. 102°; urine bright red.

July 27th: Temp. 98·4°. Saline solution still given. Albumin, trace only.

From this date the temperature continued normal, the urine became normal, and the patient made a rapid recovery. By August 3rd he was able to resume normal conditions.

I attribute the successful recovery to the continuous use of the saline solution and the injection of the 1 in 1000 perchloride of mercury solution.

A CASE OF PYORRHŒA ALVEOLARIS.

CAVERNOUS SINUS THROMBOSIS; HEMIPLEGIA.

By R. ECCLES SMITH, F.R.C.S. EDIN.

IN THE LANCET of August 2nd, 1919, I recorded under "Intracranial Lesions" a case of the above condition which is of rare occurrence. Yet within two years I have to note a further case, demonstrating the urgent need and great value of attention to the teeth both in the adult and the child.

The patient, a girl of 24 years, had a perfect cesspool in the upper jaw. She was treated for five days for an increasing swelling of the left side of the face and œdema of the left eyelid. Paralysis of the right side ensued, and she was sent to me moribund. Pronounced pyorrhœa, ulcerative gingivitis, ulceration of the cheek adjacent, with a spreading cellulitis of the face, led the way to the cavernous sinus via the pterygoid plexus of veins. Extreme proptosis of both eyes and chemosis, especially on the left side. Involvement of the left crus cerebri by its close relation to the cavernous sinus, with corresponding right-sided hemiplegia. Œdema over the left mastoid (via the petrosal sinus) completed the ghastly picture of cavernous sinus thrombosis. Death ensued in 12 hours from profound septicæmic coma, six days after the onset of symptoms.

Apart from all the minor miseries and ill-health caused by septic infection of the teeth, I think these two fatal cases should promote further interest in the question of even compulsory dental inspection and treatment.

Barry, Glam.

DEATH OF DR. A. W. D. HUNT.—Albert William Dunning Hunt died at his residence, Heylands, Chagford, Devon, on August 27th, in his forty-fifth year, after a long illness. Dr. Hunt was highly esteemed in and round Chagford; he was devoted to the people of Dartmoor, where his father and grandfather had been in practice before him. He qualified M.R.C.S., L.R.C.P. from the Middlesex Hospital Medical School in 1899, and held the appointments of house physician at the Hospital for Consumption, Brompton, and house physician and house surgeon at the Oxford County Hospital before settling in practice. He held several public appointments and was honorary surgeon to the Moretonhampstead Cottage Hospital. Dr. Hunt will be greatly missed in Chagford, and much sympathy is felt there for his widow and three young children.

Reviews and Notices of Books.

THE PATHOLOGY OF WAR GAS POISONING.

Collected Studies. By M. C. WINTERNITZ, Major, M.C., U.S.A. London: Humphrey Milford; Oxford University Press. Newhaven: Yale University Press. 1920. Pp. xxi. + 165. 41 plates. £4 4s.

IN his collected studies, issued by the Oxford and Yale University Presses, Major Winternitz presents a handsome monograph on the pathology of war gas poisoning, based on the researches of his own department of the Chemical Warfare Service, U.S.A. The work deals almost exclusively with pathological anatomy and morbid histology of the organs of experimental animals examined at various intervals after exposure to warfare gases. The changes observed in the respiratory system during the acute period of poisoning are described with great care for each of the toxic agents dealt with, and attention is again drawn to the two main types of lesion produced: on the one hand epithelial destruction, especially in the upper air passages; and, on the other, damage of the lung capillaries with resulting pulmonary œdema. According to the degree in which one or other element predominates the gaseous poisons may be arranged in a series at one end of which stands phosgene, an almost purely pulmonary irritant, while at the other end may be placed mustard gas, which exerts its effects almost exclusively on the air passages, producing membranous tracheitis and bronchitis. Chloropicrin, chlorine, and the phenylarsines come intermediately, producing both effects; in the order named they cause successively less pulmonary œdema and more epithelial damage, the results being fairly characteristic for each individual agent. In relation to the œdema of the lungs it is remarkable that Winternitz has failed to observe the specific damage to pulmonary capillaries, with thrombosis, which British and other observers have repeatedly described; the omission is possibly due to the placing of too much reliance on special fibrin staining for the recognition of thrombi.

Following the description of the acute phenomena due to the poisons themselves there is given an account of the inflammatory changes which result from subsequent infection. In dogs, which were most often used, infection occurred with great regularity and often produced fatal results in animals which would have recovered from the effects of the gas alone. In the British experiments on goats infections played an inconspicuous rôle, and it is probable that in this respect human victims occupy an intermediate place as regards susceptibility. The section of the book which at the present time possesses the most directly practical value deals with late and permanent effects of gassing, studied at periods up to six months after exposure. The most important lesions found during this period are emphysema, bronchiectasis, collapse of lung, and obliterative bronchitis, all of which may be complicated by chronic septic foci from which acute lesions may arise from time to time. In the final chapters some preliminary observations are given on experimental lavage of the lung through the trachea with a view to washing out irritant materials which have lodged there.

The book is profusely illustrated by excellent coloured drawings. While it is improbable that this work will now appeal to a wide public, it forms a record of experimental observations of high scientific value, and it will prove an interesting and suggestive book of reference to those who may still have to deal with the late effects of gas poisoning in soldiers.

GONOCOCCAL INFECTION IN THE MALE.

By NORMAN LUMB, O.B.E., M.B., B.S. London: John Bale, Sons, and Danielsson. 1920. Pp. 328. 25s.

THIS work gives a plain straightforward account of the treatment of gonorrhœa in the male. Only those methods of treatment are described which have definitely proved successful in the hands of the author; the book is eminently a practical one, and little space is devoted to questions of theory. The description of the various methods of treatment is clear and assisted by excellent illustrations. Mr. Lumb believes that skill in the use of the urethroscope is essential to the successful treatment of gonorrhœa, and for this reason devotes considerable space to the subject of urethroscopy. This portion of the work is enriched with coloured plates illustrating the various appearances, both normal and abnormal, that are to be met with during the process of urethroscopy. A complete chapter is allocated to the subject of keratodermia blenorrhagica, in our opinion a somewhat over-liberal allowance. On the other hand, that all-important subject, the standard of cure, is squeezed into a chapter devoted to a consideration of impotence and sterility. However, in spite of certain features inviting criticism Mr. Lumb's book affords a good and practical description of the treatment of gonorrhœa. It will be useful to those who already possess a certain knowledge of the subject, but who are lacking in those refinements of technique that make the difference between success and failure.

GRUNDRISS DER PHYSIOLOGIE FÜR STUDIERENDE UND AERZTE.

Von Professor C. OPPENHEIMER (München) und Professor OTTO WEISS (Königsberg i.Pr.). Erster Teil. Biochemie, von C. OPPENHEIMER. Dritte Auflage. Leipzig: Georg Thieme. 1920. Pp. 522.

THIS volume on biochemistry is the first part of the Grundriss, to be followed by the second part on Biophysik, from the pen of Professor Weiss. The second edition, already set up in 1915, was not published until 1918, and the author, while thoroughly revising the whole work, has, in the new edition, striven to give a clear and comprehensive view of the bases of the modern physiology of the cell, and has in particular rewritten the chapters on colloids, cellular metabolism, permeability, and allied phenomena, and added some matter on the pathology of metabolism—e.g., gout and diabetes—to give the effort a more "practical outlook." The biophysical part—which has not yet reached us—will deal with general nerve physiology, the physiology of movement, heart, blood-vessels, and circulation, movement of lymph, digestion, central nervous system, and sense organs, temperature, and heat formation.

In this part 268 pages—the systematic part—are given to the chemical constituents of the animal body, wherein is embodied a sufficient account of the acyclic and carbocyclic compounds, animal proteins, ferments, antigens, and antibodies. The substances of the fatty series are first dealt with, waxes, fats, lipoids, and carbohydrates are followed by benzene derivatives, aromatic compounds, purins, then the general and special chemistry of proteins. The chapter on the ferments—i.e., enzymes—seems to us both terse and comprehensive. To hydrolytic ferments as a group the term hydrolases is applied, including esterases, carbohydrases, glucosidases, amidases, and proteases. The remainder of the text is called the analytical-physiological part and deals with the chemical functions of the tissues and the organism, including the composition of living matter, foods, metabolism, intake and transport of foodstuffs including the chemical aspects of digestion, digestive secretions, absorption blood, gaseous exchanges in lungs and tissues—secretion and excretion, regulation of functions including liver, blood-forming organs, internal secretions and hormones, and lastly, supporting tissues, nerves, and muscles.

For accessory food factors or vitamines, the term "nutramines," invented by Abderhalden, is used, and so is another of his terms—viz., "increte," for internal secretion. In dealing with the secretion obtained from the pyloric mucous membrane, Bickel's name is mentioned, but not that of Edkins. Some interesting speculations are given (p. 386) as to the significance of so-called proteinogenic amines, including histamin, adrenalin, and tyramin, and their relation to endocrine glands. As the potential substances in internal secretions are chemical in nature, their general and special physiology is relatively fully dealt with.

The book is a well-balanced exposition of what the Germans regard as bio-chemistry, the physiological significance of the chemical data being made to stand out significantly.

MILITARY SANITATION.

A Handbook for Soldiers. Third edition. By Colonel ROBERT J. BLACKHAM, C.B., C.M.G., C.I.E., D.S.O., &c. London: John Bale, Sons, and Danielsson, Ltd. 1920. With index. Pp. 140. 10*s.* 6*d.*

A BOOK on military sanitation which has reached a third edition is clearly satisfying a want. It is written for officers and non-commissioned officers of the Service generally, and can be carried in the tunic pocket. It is well adapted to teach those without a previous medical training the principles and practice of hygiene; their resulting knowledge will be very exact. The quoted opinions of great soldiers are impressive and arresting, but might be more numerous. Amongst books on military hygiene perhaps the most pleasing particular feature of this little work is that detailed schemes are put forward for regimental or orderly officers inspecting kitchens (p. 72) and sanitary areas (p. 90), telling them most helpfully, line by line, where the most probable neglects in sanitary precaution will manifest themselves, and how, therefore, they may be quickly discovered. In the next edition it might be well to develop this idea further and to suggest a routine for establishing the health administration of a battalion when first formed, dumped, for example, as battalions were in 1914, on Salisbury Plain, with possibly no one of experience to guide them. To this might be added a suggested routine for carrying on the sanitation of the battalion when it has been set going and only wants to be kept up to its level. It is noticeable that "ventilation" does not occur in the index, nor is it suggested in relation to the "protective measures" against influenza or pneumonia in the very interesting chart of infectious diseases with which the book ends. There is on p. 39 an encouraging account of how the army fitted a square peg in a square hole, and Colonel Blackham's directions for waterproofing uniform with lanoline will be found very helpful if we ever have war in Europe again. He gives a good account of boots, emphasises the valuelessness and positive dangers of flannelette, and, directing particular attention to the soldier's socks, insists he should have, or, as they say in the army, "be issued with," four pairs, one more than now allowed. The book is handy, readable, and well printed.

A MANUAL OF ELEMENTARY ZOOLOGY.

Third edition. By L. A. BORRADAILE, M.A., Lecturer in Zoology in the University of Cambridge. London: Henry Frowde and Hodder and Stoughton. 1920. Pp. xvii. + 616.

To have reached a third edition in these days of competition among text-books of zoology argues the possession of merits of a definite order. That the author is accurate in his statement of facts is, of course, satisfactory, but does not call for so much appreciative comment as in former years when types were less stereotyped. It would be difficult to make nowadays a real "howler" in the account of the anatomy of crayfish or frog, though in former years the late Professor Milnes Marshall remarked upon the "quite curious difficulty" of weathering rocks and quicksands when dealing with the most ordinary material of zoology.

Mr. Borradaile, in producing even so restricted a work as this one, has had to grapple with whole libraries of zoology, and his problem in writing, as ours in reviewing, an elementary manual of zoology, must be mainly concerned with judgment and balance in selection. He is compelled to devote much space to some animals and to some views and to neglect others. For instance, he has said nothing at all about sponges. There would seem to be a fate in this. Two text-books, at any rate, are known to us of a more or less general applicability in which the same group is ignored. The writer may, however, be justified in neglecting a group the sterility of which has been emphasised by zoologists; sponges appear to "lead to nowhere in particular." Since this text-book is addressed mainly to medical students Mr. Borradaile is wise in laying stress upon those animals and groups of animals which have a bearing upon medicine and surgery. Parasites are dealt with fully and in connexion with disease. There are also chapters, or at least sections, upon matters of wide interest, such as Mendelism, Natural Selection, Fertilisation, and so forth; in fact, we cannot accuse the author of any serious omissions in these departments. Indeed, if more had been stuffed in something would have had to give place, and it is not easy to see what could best have been spared from what is a manual and not a treatise.

DIABETIC DIETING AND COOKERY.

By P. J. CAMMIDGE, M.D. Lond. London: University of London Press, Ltd. 1920. Pp. 222. 10*s.* 6*d.*

PERHAPS the greatest advance that has been made of recent years in the treatment of disease is to be found in the case of diabetes. In this book of Dr. Cammidge's both the busy practitioner and the patient suffering from diabetes will find set out in a simple manner the details of the newer methods. A patient of ordinary education with the information here provided will be able to coöperate intelligently with the physician in carrying out those precise changes in diet with which present-day treatment so largely concerns itself. Should complete abstinence from food be prescribed for one, two, or three days he will understand the raison d'être of the prescription and be all the more eager to carry it out. Quantitative regulation of diet, at first sight so difficult to effect in ordinary life, becomes comparatively easy to a patient trained for a week or two in weighing out quantities and learning by experience the weight of average servings of the common articles of food in the manner here suggested. Two very useful chapters deal with diabetic cookery and cookery recipes. In the latter upwards of 200 recipes serve to afford variety to what in the past, in too many instances, has been a daily round of monotonous menus. We question the wisdom of including the chapter dealing with diabetic coma in a book intended to be placed in the hands of sufferers from diabetes, nor are we convinced that "every patient should know how to test his own urine for sugar and adjust his diet according to the results obtained." Apart from these objections we have nothing but praise for a volume which meets a long-felt need.

MEDICO-TROPICAL PRACTICE.

A Handbook for Medical Practitioners and Students. Second edition. By GILBERT E. BROOKE, M.A., D.P.H., Chief Health Officer, Straits Settlements Government Medical Service, &c. Revised throughout and rewritten. London: Charles Griffin and Co., Ltd. 1920. With 61 illustrations. Pp. 522. 18*s.*

THE author has changed the title of his book from Tropical Medicine, Hygiene, and Parasitology to that of Medico-Tropical Practice, a change which has only brevity in its favour. The first edition appeared in 1908 and had a deserved popularity. The present volume contains 37 chapters, with an appendix and an index. There are some useful illustrations, and as most of the text is up to date the information should prove of value to students and tropical practitioners. We note the adoption of *Loschia* as the generic name of the amœbæ of man, but miss any reference to the recent work of Dobell and others on *Endolimax nana*, *Iodamœba butschlii*, and *Dientamœba fragilis*. This is unfortunate. Some of the old names are still retained for the flukes, such as *Opisthorchis*, which should now read *Clonorchis*, and *Cotylogonimus* instead of *Heterophyes*.

No mention is made of Noguchi's work on spironemata in yellow fever, nor is the new antimony treatment for bilharziasis dealt with. Omissions such as these are unfortunate as regards the teaching of students and impair the value of the work as an up-to-date handbook. The incorporation in a future edition of such new work will make the book of real value to students and junior practitioners. Parts of it now are excellent.

JOURNALS.

Journal of Hygiene. Vol. XIX., No. 1. July, 1920. Edited by G. H. F. NUTTALL, F.R.S.—This issue contains interesting articles on bacteriological and hygienic subjects. The attention of pathologists is drawn by the editor to the Second International Congress of Comparative Pathology, to be held in Rome in April, 1921.[1] Tetanus: Analysis of 1458 Cases which Occurred in Home Military Hospitals during the Years 1914–1918, by Sir David Bruce, K.C.B., F.R.S. This interesting and useful summary was dealt with in a leading article last week. Reference may here be made to one or two special points. Sir David Bruce shows, we think, quite clearly that the prophylactic use of serum was effective in cutting down both the incidence and the mortality of the disease, though he believes that thorough surgical treatment of wounds was of very great importance. The therapeutic use of serum was, however, disappointing, as was to be expected from the knowledge already gained before the outbreak of war. Professor Sherrington's work, which established the intrathecal route as the best for administration of the serum, is referred to. Anaphylactic shock occurred in 49 cases of tetanus treated with serum, with 12 deaths. Of these cases of shock, 17 were caused by intrathecal injections, 14 by intravenous, 9 by intramuscular, and 2 by subcutaneous. Anaphylactic shock was thus not a rare phenomenon.—A Study of the Serological Reactions of Meningococci and an Account of the Method of Preparation of Antimeningococcus Serum, by A. Stanley Griffith, M.D. The first part of this long article is devoted to an account of work on the separation of types of meningococci by means of the agglutination reaction. The author concludes that "Gordon's classification holds good if care is taken in the selection of strains for the production of type sera," but that "all the strains included in each type are not identical in their serological characters," and that "there is inter-relationship between the types." In the second part of the paper Dr. Griffith discusses the methods of preparing anti-meningococcal serum.—Carriage of Coliform Bacilli by the Oriental Hornet (*Vespa orientalis*, Fabr.), by P. A. Buxton, M.A., M.R.C.S. The author examined, by dissection and by plating on McConkey's medium, the gut contents of the large red oriental hornet which is common in Mesopotamia. The hornet is a foul feeder, and Dr. Buxton shows that of 64 examined 23 were carrying well-known types of intestinal bacteria.—On Defence Rupture and the Antagonistic Action of Salts, by C. Shearer, F.R.S.—Report of Experiments on the Cold Storage of Herrings Carried out at North Shields (June and July, 1919), by Ione H. Green. The author draws the following conclusions from the work described in this paper—that brine-freezing is more satisfactory than dry-freezing, and that ungutted frozen fish keep better than gutted ones. The need for the most elementary measures of cleanliness in the handling of fish is pointed out. At the present time apparently waste is common owing to the lack of proper organisation in the fishing industry.—An Inquiry concerning the State of Cleanliness of Empty Milk-churns, by R. H. Cumming and A. T. R. Mattick. It is shown in this investigation that the present inadequate methods of washing and cleansing churns is one cause of the loss of milk through souring in transit.—Suggestions for a New Criterion of a Positive Wassermann Reaction Based on an Analysis of 2334 Quantitative Tests, by C. H. Browning and E. L. Kennaway. The new criterion is "based upon a comparison of the amounts of complement giving complete lysis with any given serum, and with the negative control, respectively." The article will be read and studied by those who are occupied in carrying out the Wassermann reaction.—The Milk-supply of the City of Edinburgh, by A. Cunningham and B. A. Thorpe. The authors examined 40 samples of milk from the supply of the city of Edinburgh, and found that the bacterial content was of about the same order as that reported from other large cities. They recommend the reductase test for obtaining a rough idea of the numbers of bacteria present in milk.—The Wilson-Weil-Felix Reaction in Typhus Fever, by W. James Wilson, M.D., D.Sc., D.P.H.—This article gives a valuable historical account of the reaction as diagnostic in typhus fever. The author suggests that the explanation of the occurrence of agglutinins to the proteus bacillus X19 is that in typhus fever a bacterium, which is a normal inhabitant of the human intestine, gives rise to agglutinins for itself and group agglutinins for numerous other organisms, especially X19 and X2 proteus bacilli.

Quarterly Journal of Microscopical Science. Edited by Sir E. RAY LANKESTER, K.C.B., F.R.S., &c., with the coöperation of Professors HICKSON, F.R.S., GILBERT BOURNE, F.R.S., J. GRAHAM KERR, F.R.S., and E. W. MACBRIDE, F.R.S. Vol. LXIV., Parts 2 and 4.—*Journal of the Royal Microscopical Society.* Edited by C. SINGER, M.D., with the assistance of Professor J. ARTHUR THOMSON, LL.D., Messrs. DISNEY, I. G. RAWLINS, Dr. RENDLE, F.R.S., and Dr. R. ST. JOHN BROOKS, M.A., M.D. 1919 Part 4; 1920, Part 1.—The two parts of the *Quarterly Journal of Microscopical Science* noticed here contain between them seven memoirs, all of which are of importance.—In a memoir on "Determination of Age in Honey Bees," Mrs. Goodrich states that these insects die not only from various bee diseases or from violence, but perish worn out by work and old age. It would appear that in the height of the honey-flow worker bees literally work themselves to death about six weeks after hatching. Mrs. Goodrich points out that such bees, not suffering from any bee disease, can not only be recognised by their worn appearance and frayed wings, but an examination of the brain cells establishes their senile condition. Figures of these cells in freshly hatched insects and in those of greater age show obvious degenerative changes in the latter. From the economic point of view it is clearly important to be able to distinguish between those insects which are suffering from a possible unknown bee disease and those which are merely senescent and dying.—A second paper of great interest, by Professor Hickson, concerns the rediscovery of *Protohydra leuckartii* in this country. Originally—and as long ago as 1868—Professor Greeff found this simple organism—which is practically a hydra without tentacles—at Ostend, near which town it was again found in 1892. It has now cropped up in tidal marshes near Southampton, and in a postcript Professor Hickson announces that further specimens have been found near Plymouth. He details such facts as he has noted from the examination of abundant material regularly supplied to him at various periods of the year; hitherto he has been unable to find any trace of any medusa stage.—As to the other communications in the journal Professor Gemmill continues his well-known studies among the Echinodermata in a memoir upon the development of *Crossaster papposus*, while Mr. Bronte Gatenby continues his series of articles on the Cytoplasmic Inclusions of the Germ Cells.—The *Journal of the Royal Microscopical Society* contains, as usual, a few memoirs read to the Society, and a mass of abstracts of current research on both animals and plants. The latter, as has been customary in recent years, bulks most largely, and is of the greatest use to workers in all departments of biology. It forms a useful supplement to the lists of titles of papers published annually in the Zoological Record, and its value is enhanced by a few woodcuts. It includes a good summary, with three illustrations, of the recent well-known investigations on the "spiroptera cancer" in rats, with special reference to the part played by the cockroach.

British Journal of Experimental Pathology. Vol. I., No. 3. June, 1920. Editors: C. H. BROWNING, P. FILDES, W. E. GYE, E. L. KENNAWAY, E. H. KETTLE, J. MCINTOSH, J. A. MURRAY, W. J. TULLOCH, C. M. WILSON. London: H. K. Lewis and Co., Ltd. Price 7*s.* 6*d.*, annual subscription £2.—The third number of this journal maintains the high standard of previous numbers. A leaflet is enclosed containing a series of summaries of all the papers published up to the present in the journal. These summaries are concise, and are printed in small type, occupying just enough space to be convenient for a card-index system. This novel and useful innovation is apparently to be continued in subsequent issues. The Antigenic Properties of *B. psittacosis*, by H. M. Perry. The organism was isolated from a grey touracou native to South Africa. The investigation was undertaken to establish the identity of the organism. It was found that the antigenic properties of the bacillus are identical with those of the "mutton" type of *B. aertrycke*.—A Method for the Estimation of Urea by Soy-Bean, by E. L. Kennaway. The method detailed is simple, gives accurate results, and should therefore be of great practical importance in the clinical laboratory. Amounts of 1 mg. of urea can be estimated by the method with an accuracy of 97 per cent.—The Value of the Vital-red Method as a Clinical Means for the Estimation of the Volume of Blood, by D. T. Harris. The method of estimating the volume of blood by means of innocuous dyes depends upon the introduction into the vascular system of a known weight of the dye, and then, after allowing time for the dye to become uniformly distributed and before passage of the dye from the vessels begins, to take a sample of blood and estimate the concentration of the dye therein. Vital-red is, from the standpoint of safety and simplicity, the most useful substance for the determination of the blood volume of man. Its reliability has been tested by Dr. Harris, who finds out that, owing to the rapidity with which vital-red leaves the vessels, the method gives results which are too high. The optimum interval for taking a blood sample is two to two and a half minutes. The correction-factor for cats and dogs for a four-minute interval is 0·78, for a one-minute sample 0·9. For man the correction-factor probably lies between 0·8 and 0·9.—The Ætiology of Influenza, by P. Fildes and J. McIntosh. This article completes the review of the subject begun in the previous number. The authors weigh the evidence for and against the view that influenza is caused by a filterable virus, and conclude that the balance is against this view. Finally, the conclusion reached is favourable to the view that *B. influenzæ* is the specific microbic agent in influenza.

[1] See THE LANCET, August 21st, p. 411.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 11, 1920.

The Physician in the War.

UNDOUBTEDLY the surgeon had the time of his life during the years 1914 to 1919. He then obtained more operative practice in a few short months than would otherwise have fallen to his lot in a lifetime. He enjoyed skilled coöperation, with abundant opportunity of mutual help and counsel. In view of the circumstances no leave had to be wrested from relatives for performing biopsies or autopsies. The services of bacteriologist, registrar, and statistician were at his elbow. Surgeons from all parts of the country and from many civilised lands got to know each other as friends and professional colleagues, with lasting advantage to the fraternity of surgery. No wonder surgery made great advances. The time of the physician came later, and never so completely. The war needed him just as much, but at the outset no one in authority was clear-sighted enough to see this, although it is now obvious that the early recognition of epidemic disease was a matter on which the lives of thousands and tens of thousands might hang. The official stage appeared complete with the trilogy of surgeon, sanitarian, and bacteriologist, and although the diagnosis of all known and some unknown infectious diseases was in reality a task for the highest medical ability, it was not until the campaign was half over that the consulting physician began to take his due share in affairs on the field of battle and behind the lines. What this share was is attractively portrayed in the first Lumleian lecture, which we print on another page.

War conditions made the physician's work essentially different from that of civil practice. In the first place the opportunities of group study were almost boundless. Not only infectious diseases but maladies of all kinds were notified, and during the latter part of the campaign facilities were such that the physician could take his choice of a syndrome which interested him and work it out in various areas of the vast field of hostilities. In spite of the great relative improvement in hygienic conditions since the Crimean war, of which sanitarians never weary of telling us, and the remarkably small proportion of disease during the whole campaign, still, as Sir JOHN ROSE BRADFORD reminds us, the actual numbers of sick were far larger than those of wounded. Interest was not limited to the diseases generally recognised in association with campaigning. Typhoid, cerebro-spinal fever, trench fever, dysentery, and the like, had their special attraction to clinician and epidemiologist, but an impetus was also given to the study of such everyday disorders as acute rheumatism and lobar pneumonia. Sir J. ROSE BRADFORD remarks on the rarity of acute rheumatism in the field. With an unprecedented population of young males and a very large population of young females, exposed, as never before, to the rigours of wet and cold, this immunity would have been astounding had not Sir ARTHUR NEWSHOLME, when medical officer at Brighton, prepared us to associate acute rheumatism with dryness and warm spells of weather. The war-time physician has established beyond a doubt this observation of the peace-time sanitarian. During his whole service in France Sir J. ROSE BRADFORD saw no death from acute rheumatism nor any case of rheumatic hyperpyrexia. Acute infective endocarditis, when it occurred, developed, as a rule, on healthy valves, and only rarely as an incident of gunshot sepsis. So much for rheumatism. The war also gave Dr. ADOLPHE ABRAHAMS his opportunity of studying lobar pneumonia in a large population of recruits at Aldershot. His analysis on p. 543 of the frequency of symptoms and complications has the special value arising from uniform observation, for the cases all came under his own eye. He had, unfortunately, no opportunity of making an exhaustive survey of the troops in order to define the relation between constitution and susceptibility—he was not even able to obtain, when he wanted them, the figures of the monthly strength in the Command—but he did adduce the striking fact that 62 per cent. of his total cases fell sick of pneumonia within 12 days of joining up. And this was before the influenza pandemic began. The total mortality of his 558 consecutive cases was just under 11 per cent., being markedly less than the 30 per cent. of the Johns Hopkins Hospital and the 17 per cent. of the Middlesex Hospital (1880–89), both observed on about the same number of cases, but greatly in excess of the 3·6 per cent. (quoted by Osler) among 40,000 picked men in the German army. Double pneumonia had a threefold mortality—namely 29 per cent. Herpes labialis was reinstated in its position as signum bonum—occurring, indeed, only in 17 per cent. of the whole, but heralding a mortality in these of little more than 4 per cent. The seventh day proved to be far the most popular day for the crisis, which is more credible than Dr. ABRAHAMS'S singular confirmation of the old legend that the critical fall affects the odd day in general. Empyema was unduly frequent in the Aldershot cases, even before the influenzal epidemic which stamped it as a common and very fatal complication. Dr. ABRAHAMS notes the large proportion of cases in which simple aspiration was sufficient to clear up the effusion.

Over and above the enrichment of the differential study of disease afforded by the circumstances of war, Sir J. ROSE BRADFORD'S experience gave him a further opportunity of great interest, that of comparing the incidence and mortality of disease in the various nations represented among the British forces. The actual attack-rate of tuberculosis was much the same among English, Canadian, and Australian contingents, whilst among the New Zealanders it was much higher. On the other hand, the resistance to tubercle displayed by the men of home origin was vastly greater than that of the Maories or of the natives of South Africa and the West Indies, men from the Dominions coming intermediately between the two extremes. No single instance of chronic or quiescent tubercle was found among an extensive series of autopsies on men of native races, although in over half the total find of pulmonary tuberculosis the lesion was quiescent. Racial variations in immunity, whatever their explanation may be, are of great interest. Obviously the material for comparison of the infectivity and virulence of disease among men of various races should be available in abundance, and the time should be approaching when analysis and classification of this experience will be available. The Lumleian lectures will make a fitting introduction to this important chapter in the medical history of the war.

Anatomical Terminology.

ANATOMY is a subject which extends far beyond the horizon of the medical student and the ordinary usage of the great majority of practitioners of medicine, so that there is nothing surprising in the fact that many of its terms have a significance for the follower of the science which they do not possess for those who only concern themselves with descriptive human anatomy. For these last they are often merely "labels," sound and fury signifying little, the evil inventions of the malevolence of terminologists. But let it be remembered that anatomy is a living science apart from medicine, the technical language of which includes its nomenclature, and it becomes evident that this language must also be living, and must come under the laws which apparently govern all living things. It is comparable with any national tongue, subject—like that tongue—to evolution under changing circumstances, and it will only reach its final form when it becomes a dead language. Philologists would be puzzled to assign reasons above criticism for the survival of some words in a language, and for the decay of others which would appear to be suitable for retention, yet such happenings are but the common results and evidence of the gradual evolution of a tongue, and similar changes have taken place and are taking place in anatomical nomenclature. Moreover, it seems that this natural evolution cannot be changed, hurried, or replaced by artificial means. The factors which mould languages in different ways under different suns may be elusive, but they are none the less effective in their action. Both these effective agents are traceable in the different languages of anatomy. Those who are acquainted with the old literature of the subject know of many examples of descriptive labels which, at first in common use, have undergone different changes in different countries as the study became less international and more in keeping with national modes of thought. We have, in the Basle Nomina Anatomica (1895), a serious attempt to impose an artificial formal terminology on the world of anatomy, as if the Tower of Babel were no longer worthy of consideration. Already those who have taken it up are suggesting various changes in it, and the suggestions from different countries do not by any means coincide in their tendencies. This is not surprising, and is only on a small scale what we should expect if an attempt were made to put Volapuk in place as a substitute for all the tongues spoken to-day.

It would seem probable that the B.N.A. in its present form will fail to hold its ground, in spite of its capture of some literary strongholds, even as BARCLAY'S proposals failed a century ago. No doubt certain of the terms will survive, as some of BARCLAY'S have survived, but this will be on account of their applicability and English fitness from the evolutionary standpoint, not because they are at present on the Basle list. In our last issue Dr. CUTHBERT MORTON summed up his efforts in the cause of "simplification" of anatomical language in an interesting and entertaining paper. Once more it seems probable that this scheme will yield a few additional or alternative terms to the literature, but its ultimate fate may be that of every attempt to force the hand and influence of time. Dr. MORTON brings together, and endeavours to meet, many of the complaints urged against the anatomical language of the schools. These complaints and accusations crop up from time to time, and it may be of interest to consider some of them. It is said frequently that much confusion exists between the terminologies, and valiant efforts are made to cure this confusion by adding to it; or the confusion is referred to the use (or existence) of several names for one thing. But surely one of the signs of vitality and richness in a tongue is the possession of synonyms and words with progressive differences of meaning, and the occurrence of different terms in anatomical nomenclature is usually an indication of increasing and widening knowledge, and a necessary accompaniment of the effort towards perfection which is the keynote of evolution. A language which does not change with time, and increase in volume, is dead. Where several terms exist for one thing, one of them tends from its fitness to be used, and the others become secondary and, in some cases, disappear. Again, it is urged that the student is overcome by the difficulty of the labels that he must acquire. Teachers of experience deny this altogether, and hold that he has no more relative difficulty in acquiring the terms of anatomy than in learning the technical words used in the half-dozen games which he plays. It may be pointed out, moreover, that successful teachers of anatomy are not formal in their methods, for pedantry and formality are closely associated, and neither makes for inspiring teaching.

Confusion in the use of terms of position is another evil laid to the charge of the present nomenclature, and laid there unjustly, for in practice no confusion arises when the terms are used by anatomists, and if confusion is present in the student's mind it must be referred to want of instruction in his early days, not to inherent defect in the system of nomenclature. All who teach changing classes must have seen the limitations imposed on students by their ignorance of dead tongues which still live in their widespread influence, and when Dr. MORTON, for instance, describes the student as overcome by the complexity of the labels to be remembered, the blame may really lie, not on the anatomical terms, but on the faulty education of the student which does not enable him to make use of the information furnished by those terms. It would be as reasonable to refer the misuse of words by the illiterate to shortcomings in the English language itself. Most of the forms found in anatomical works of to-day are relics of that time when Latin was the common tongue in which all learned books were written. Latin and Greek words of this sort have been adopted into English; we talk of the biceps, the extensors, the larynx, the trachea, and so on, and these names seem to us almost as English. Many of the names given to muscles are used as nouns, whereas they started in life as adjectives. Greek and Latin terms which have come through the evolutionary mill are becoming anglicised, and it would probably be impossible to uproot them even if it were desirable to do so. But the use of Latin to-day is on a different footing. It may have international value, although this is probably overestimated; those who are in the habit of reading foreign literature have no difficulty in fitting the English equivalent to the foreign term, and it seems unnecessary to introduce a third class to stand between them.

Respiration and Fitness.

THE application of physiological knowledge to practical purposes has probably nowhere been more useful than with regard to the principles of respiration; prolonged storage of cereals has been rendered possible by conditions which make respiration impossible for the destructive weevil; caisson disease has ceased to be an unpreventable accident since the principles underlying the absorption of gases by the blood were employed to illuminate its mystery; while for the construction of mine rescue apparatus a grasp of these principles is fundamental. Nothing creates a stronger appeal to humanity than news that owing to a colliery explosion a number of men are incarcerated in the workings, dependent on the immediate exertions of others for their release. Volunteers are always ready to risk death in the attempt, and many noble lives have thus been lost. Science teaches that no attempt should be made unless the rescuers (1) are suitably protected against the dangers they must face, dangers associated with the poisonous atmosphere they must enter; and (2) are physically fit to undertake the endeavour. A Committee appointed by the Department of Scientific and Industrial Research to consider mine rescue apparatus in a first report[1] issued in 1918 laid down certain stringent requirements based on physiological principles. This Committee has continued its work, and in a second report[2] recently issued shows how these requirements can be fulfilled. The report deals in succession with the two points mentioned above. The various types of rescue apparatus are discussed, and the compressed oxygen apparatus, designed by Dr. HENRY BRIGGS, a member of the Committee, is carefully described. The underlying principles are the same as in all other types; oxygen is supplied to the wearer from a cylinder he carries, and the carbon dioxide he exhales is absorbed by caustic potash. The apparatus cannot be explained with justice without entering into technical details of construction, and the reader should refer to the report itself to appreciate the advantages which belong to the BRIGGS apparatus; it is enough here to say that it reflects credit on its designer and fulfils the necessary requirements.

Not the least interesting part of the report is that dealing with physical fitness. Here we trace the scientific mind of Dr. J. S. HALDANE, a member of the Committee, speaking on a subject of which he is the accepted master. A remarkably clear and concise summary is given of the processes of respiration; the way in which the pressure of carbon dioxide in the blood acts independently of the oxygen pressure is emphasised; and attention is drawn to the different and independent action of oxygen-want and carbon dioxide excess in stimulating respiration. Evidence is quoted (*a*) to show that while in an ordinary person diffusion of gases through the pulmonary epithelium will explain the access of oxygen to the blood, "the physical laws of diffusion do not explain the phenomena of blood-oxygenation when the subject is making a special demand on oxygen-supply" either because he is doing physical work or because, as airman or mountaineer, he is breathing rarefied air; and (*b*) in support of "the view that the epithelium is not a mere porous diaphragm, but that the living cells from which it is built possess the faculty—which they exercise at need—of secreting oxygen from the air and of handing it forward at enhanced pressure to the blood." An interesting and new point now emerged—men in good physical training, such as practical miners, were found to possess this power of secreting oxygen from the air.

"Hence, in men who are accustomed to muscular exertion, there is no deficiency of oxygen in the arterial blood when ordinary air is breathed until exertion is pushed to the utmost. For this reason they also receive no benefit from breathing air enriched with oxygen. On the other hand, in men who are not accustomed to muscular exertion, the epithelium fails to pass in the proper supply of oxygen unless the diffusion pressure of oxygen is raised in the alveolar air by the enriched inspired air. Hence these persons benefit by enrichment of the air with oxygen. ..... It is evident that the physiological response of a man to oxygen during muscular exertion furnishes an interesting test of whether or not he is in good training as regards his lungs. Physiological fitness depends not only on the lungs, but also on ready adaptation of the circulation, muscles, nervous system, &c., to whatever exertions are required. ..... In ordinary cases, however, lung fitness is an accompaniment of general physical fitness, and may therefore be taken as a measure of it."

We have quoted Dr. HALDANE'S ingenious reasoning at some length, as it is apparently at variance with the views of Mr. J. BARCROFT, given in his own words in our issue of last week. Mr. BARCROFT, it will be remembered, supported his thesis by exact and quite heroic experiment on himself; but we do not know whether Dr. HALDANE would admit that he was in good physical training at the time of his sojourn in the glass-cell. Based upon the reasoning quoted above, Dr. HALDANE has evolved a method of testing physical fitness which has been used for airmen, and should also be applicable to members of a mine rescue brigade. The method, described in an appendix by Dr. BRIGGS, should be submitted to further tests, for if its value be confirmed it will be useful in other fields; for example, to test the capacity of athletes to endure the strain of strenuous and prolonged exertion, say for a contested boat-race. A further instance of the practical value of the research carried out is to be found in an estimate, contained in the report, of the most energy-saving rate of walking—a matter of importance to the economical movement of infantry. "Like a steamer or an airship, a man has a most economical speed at which he goes furthest per litre of oxygen or per pound of food." The investigation revealed that when carrying a load of 43 lb., the weight of a rescue apparatus, the most economical speed for certain subjects was 3 miles an hour and for others 4 miles; the subjects, however, were walking along an even surface, and "under the conditions obtaining in the mine we judge that rate to be about 2½ miles per hour when travelling a flat road and carrying a rescue apparatus." The speed fixed may be compared with that stated by AMAR,[3] who places the most economical rate of walking along a flat surface at 2·8 miles per hour, but considers that if a weight of about 45 lb. is being carried the pace should be slowed down to 2·6 miles. It can now be gathered that the research published in this report is of first-rate importance; the work is still being continued, and further valuable results may be expected.

[1] THE LANCET, 1918, ii., 361.

[2] Second Report of the Mines Rescue Apparatus Committee. Department of Scientific and Industrial Research. 1920. H.M. Stationery Office. Pp. 60. 2s.

[3] Amar, Jules: The Physiology of Industrial Organisation Translated by M. Miall. Library Press, Limited. 1918.

Annotations.

"Ne quid nimis."

NYSTAGMUS AND ILLUMINATION.

THE getting of coal from deep measures, upon which, as is being so forcibly impressed upon us this month, modern life depends, was rendered possible by Newcomen's steam engine invented in 1712 for pumping out water-logged mines. Then Watt improved the invention for use in mines and elsewhere. Forthwith the working of deep coal measures became practical, and industrial expansion a possibility; but all was for a moment checked by danger to life and limb from explosions. Another invention followed, the Davy lamp; the public owe it much, for through its use coal has been got which otherwise must have been left in situ. But for the miner this lamp has been a mixed blessing. It has carried him deeper and deeper into the earth into places fraught with danger; it condemned him to asthma until ventilation came to his rescue; it has limited his illumination and afflicted him with nystagmus. This latter disease has received considerable attention of late years. An excellent paper on its economic aspect was read at the Brussels Congress of the Royal Institute of Public Health by Dr. T. L. Llewellyn, an expert authority on the subject to whom the miner owes much for his steady insistence on bringing the facts forward. This paper appeared in the *Colliery Guardian* of June 4th, and has now been made accessible to medical readers in the current number of the *Journal of State Medicine*. The prevalence and distribution of the disorder have become known owing to its inclusion among diseases for which compensation must be paid. Its prevalence discloses that 6000 miners in England and Wales are disabled on its account each year; its distribution establishes that the disease is unknown in metalliferous mines; that among coal-miners only coal-getters are affected, and only coal-getters in mines where safety lamps are used. The disease is not confined to the United Kingdom, but prevails among miners in Germany, Belgium, and the North of France, whereas in the United States, notwithstanding inquiry,[1] the disease does not appear to be prevalent.

The symptoms of the disease are now accepted; the distressing psychology they give rise to is becoming recognised, but the pathology remains obscure. Fortunately the distribution of cases establishes clearly the relation the disease bears to inadequate illumination and points to the means necessary for prevention. The difficulty with the safety lamp is that the gauze around the light cuts off many rays, and the illumination becomes less and less as work proceeds and coal-dust collects on and blocks up the mesh of the gauze. Dr. Llewellyn, who has measured the light in mines, calculates that "the amount of light acting on the retina may be so small an illumination as only 0·0018, or roughly 1/2000th part of a foot-candle. ..... Up to 1914 over 90 per cent. of the safety lamps in use gave less than 0·5 c.p. at the coal face." A standard illumination of 0·1 foot-candle over the whole working area is called for, and illustrations are given showing the advantages gained through whitewashing and stone-dusting the roads. The cost to the mining industry in compensation paid and loss of coal output is estimated at over 1 million pounds a year; nor does the harm stop there, since the loss of coal affects other industries, and the direct loss to the nation approximates at 1*d*. per ton of coal raised.

At the same Congress at which this valuable paper was presented Dr. F. Shufflebotham, another well-known writer on this disease, when putting forward a case for the science of industrial medicine, claimed that although miners' nystagmus was the commonest occupational disease known to medical science, it was only one of the several occupational diseases affecting miners, and only one of many disabling conditions at present hardly recognised by the medical profession as affecting the general working population. Dr. Llewellyn states that steps are being taken to discover and introduce more effective and equally safe illumination for fiery mines. Necessity is as much the mother of invention now as when Newcomen invented the steam pump. Necessity is surely present in this case, and we hope that in the near future the problem will be solved. Then miners' nystagmus will disappear, as miners' asthma has already done. Relief from disease and danger may, as Professor E. L. Collis suggested last week in a letter to the *Times*, go hand in hand with a cessation of the fretfulness that threatens to paralyse industry.

[1] Miners' Nystagmus, F. L. Hoffman. 1916. Washington.

WORK OF THE GOVERNMENT LABORATORY.

THERE has evidently been heavy pressure upon the staff of the Government Laboratory during the year ended March 31st, 1920, judging from the details given in the annual report just issued and signed by Sir James J. Dobbie, the principal. The returns constitute, in fact, a record. The total number of samples examined in the course of the year, including those dealt with at the outport chemical stations, was 368,898, as compared with 289,180 in the preceding year, an increase of nearly 80,000. The examinations represent therefore the passing through the laboratories and stations of over 1000 samples a day. The number examined at the Central Laboratory alone (Clement's Inn) amounted to 199,388, against 184,392, an increase of approximately 15,000. As is stated in the Appendix, the principal increases are due to goods liable to customs duty, such as wines, sugar, tea, and cocoa preparations, and the volume of work here seems to be a sure indication of the revival of trade after the return to peace conditions. Conversely, large decreases are shown in the samples submitted by such Government Departments as the Admiralty, Air Ministry, and the War Department. The report shows a deterioration in the quality of tea, since of 16,562 samples examined 6695 were reported against, or 40 per cent. of those examined. It is interesting to note that tea is examined at the port of entry by tea inspectors, and doubtful samples requiring a more complete examination than is possible by these inspectors are sent to the Central Laboratory. The increase (representing a much larger return than in pre-war times) is attributed again to a revival of trade, the tea imported last year amounting to over 500 million pounds, as compared with about 370 millions in the year ended March 31st, 1914. Restricted times in regard to the sale of alcoholic drinks may have some bearing upon this increase in tea consumption. By far the greater part of the samples rejected was owing to the presence, it is stated, of foreign matter accidentally swept up with the tea, and not to intentional adulteration. On the whole, therefore, the tea supplies were satisfactory, and indeed, considering the difficulties of the situation, the imported food commodities in general approached quite a good standard. Passing to the control exercised by the Government Laboratory over the work of the public analysts of the country under the Sale of Food and Drugs Acts, in the majority of referred cases (121 samples in all) the analyst's conclusions were upheld. The most important cases were as follows:—

Butter.—One sample contained foreign fat and one excess of water, as alleged by the public analyst.

Vinegar.—Both samples consisted of artificial vinegar, as alleged.

Cream of tartar.—The results agreed with those of the public analyst, who had found an excessive quantity of lead in the samples.

Beer.—The samples were referred by magistrates in connexion with proceedings under the Beer (Prices and Description) Order, 1919. In one case the original gravity differed from that found by the public analyst. In the remaining seven cases there was no information as to the finding of the public analyst.

Whisky and gin.—The point in dispute in the case of all the samples was the alcoholic strength; but it is not known whether or not the results were in agreement with those of the public analyst.

In the case of ginger alleged to contain spent ginger, the results did not agree with those of the public analyst.

In the case of canned peas alleged to contain copper, camphorated oil alleged to be deficient in camphor, mustard alleged to contain foreign starch, and bicarbonate of soda alleged to contain arsenic, the results agreed with those found by the public analyst.

In the 89 cases of milk samples in which certificates were issued the charges were as follows: in 26 cases, added water; 45, abstraction of fat; 6, added water and abstraction of fat; 2, presence of preservatives; and 10, presence of dirt. In 7 cases the results were not in agreement with those of the public analyst.

The smooth working of these Acts must have been much disturbed through the period of the war, inasmuch as regulations varied from time to time in regard to the constitutional requirements of certain foods, in accordance with the regulations issued by the Food Control Board. But the pleasing indications of this report are that we are steadily approaching normal conditions again in regard to the "nature, substance, and quality demanded" of the commodities concerned.

ACUTE DIFFUSE PERITONITIS.

IN a recent issue of the *Journal of the Royal Army Medical Corps* Major Basil Hughes, R.A.M.C., (T.F.), describes a treatment for acute diffuse peritonitis which in his hands has saved 20 out of 21 serious cases. The peritoneum left to itself can deal with infection if not too massive, but it is hampered by distension of the intestine which restricts it blood-supply, while vomiting reduces the fluid available to form curative exudations. Major Hughes relieves the condition by whatever operation is required, with as little disturbance as possible to the peritoneum and a minimum of drainage. The subsequent course of the patients is almost regular, and they do not have distended intestines. Subcutaneous saline, 10 pints in 24 hours, is given for two days, and is then reduced to five pints until the vomiting, which has gradually been becoming less frequent and clearer in colour, ceases on the fourth or fifth day. Morphia, $\frac{1}{4}$ gr. every eight hours, and atropine, $\frac{1}{100}$ gr. every 12 hours, for the first three days, have "splinted" the intestine. Copious drinks of water containing sodium bicarbonate and citrate, given from the beginning to wash out the stomach and allay thirst, have secured by the third day free diuresis. Flatus is passed on the third, a foul stool probably on the fourth day. Glucose is given all the time per rectum. When vomiting ceases food is given very gradually by the mouth. Castor oil on the tenth day, and after that diet may be cautiously increased. Illustrative details are given in the article.

A PIONEER IN SPIROMETRY.

Spirometry, or the measurement of vital capacity, has gone through many vicissitudes since its introduction at Brompton Hospital by Dr. John Hutchinson in the early part of last century. Professor G. Dreyer dedicates his recent exact study[1] of the use of this measurement in assessing physical fitness to the memory of this Dr. Hutchinson, of whom the following biographical details are available. John Hutchinson was the only son of James Hutchinson, of Ryton, near Newcastle-on-Tyne. He was born in 1811 and received the more important part of his education at University College, London, then recently established to meet the needs of students debarred by theological tests from attending the older universities. Sir Charles Bell had been teaching anatomy in London since 1806, and his studies of the nervous system and its relation to respiratory movement resulted in his appointment as professor of physiology at the College, Dr. Dionysius Lardner, the versatile scientific writer and encyclopædist, being professor in natural philosophy and astronomy. These were John Hutchinson's teachers. He was not only a hard-working student, but soon became a teacher, lecturing first at the various metropolitan institutions and later in his native town. He was accustomed to visit the coal mines and to study the common causes of accident. He was elected M.R.C.S. in 1836, and undertook work at the Southampton Dispensary, Leigh-street, London, but his interests centred in scientific rather than clinical medicine. He made numerous experiments on the conducting powers, dryness, and resistance to the progress of fire of materials used in building houses, and published a work on the subject in 1843. In 1842 he was elected a Fellow of the newly established Statistical Society. His knowledge of coal gases led him to adapt the principle of the gasometer to measure the quantity of gases used in respiration. He made observations on nearly 4000 people, and tabulated the results according to height. He also used a mercurial gauge to measure the inspiratory and expiratory pressure, and tabulated the results according to professional or industrial occupation. He communicated papers embodying all these tables to the Society of Arts and to the *Quarterly Journal* of the Statistical Society of London in 1844, publishing his results later in a booklet entitled "The Spirometer" (1852). After his appointment to the position of assistant physician to the Brompton Hospital he began to measure the vital capacity of the patients suffering from chest trouble, and urged the general use of the spirometer in the detection of early or threatened phthisis. He was awarded the degree of M.D. by the University of Giessen in 1846. He communicated a more extended description of his studies in respiration to the Medico-Chirurgical Society of London in 1847, which was translated into German and published as a separate pamphlet in 1849. His other contributions included papers on heat, malaria, and ventilation to the *Journal of Public Health* (1848) and an article on the thorax for Todd's Encyclopædia of Anatomy and Physiology. He gave valuable evidence before a Select Committee of the House of Lords on the Prevention of Accidents in Coal Mines. He must have been a versatile man, for we read: "He was also gifted with an exquisite ear for music; his execution on the violin was masterly. He had a great ability as a draughtsman. He sculptured admirably in bas-relief and painted in oils." His restless spirit was constantly searching for new outlets. Soon after the discovery in 1851 of gold deposits in Australia he left England and began to make extensive collections of various gold-bearing rocks which he intended should become the property of the British Museum, but for some unknown cause they found some other destination. Of his career in Victoria for the next eight years nothing is known, and it does not appear that he made any further contribution to science. In 1861 he travelled to the Fiji Islands, dying there in July of that year.

[1] The Assessment of Physical Fitness. Cassell and Co. 1920. 10s.

"APPARENTLY DEAD."

THIS is the title of an interesting note by Mr. W. G. Spencer in the September issue of *Medical Science*. He cites a case described[1] by E. Rautenberg which would have been buried alive, had it not chanced that the coffin was reopened for purposes of identification. The woman had been reduced to the state of a hibernating animal by an overdose of morphia and by cold. The doctor who examined her in the mortuary applied only one special test, that of dropping sealing-wax on the skin. He made no note of the state of the pupils, which were subsequently found contracted. The details are as follows:—

On Oct. 27th, 1919, a hospital nurse, aged 23, bought from an apothecary in Charlottenburg for 20 marks 50 c.cm. of a 3·5 per cent. solution of morphine, and 10 powders each containing 0·5 g. of veronal. She then went into the Grünewald, and about 4 P.M. swallowed about 1·7 g. of morphine and 5 g. of veronal. She wandered about as in a dream until she lost consciousness. The weather was cold, the temperature during the night being 1-3° C., and wet.

When she was found the next day, she was assumed to be dead and was taken to a mortuary, where the medical officer of the district examined her. The body had a deathly pallor; there was an absence of pulse, of respiratory movement, of the heart sounds, and of all reflexes. There was partial

[1] Ein bemerkenswerter Fall von Scheintod. Deutsche med. Wchnschr., 1919, 45, 1277.

stiffness of the trunk and limbs, and it was assumed that rigor mortis was as yet incomplete. There was no reaction to sealing-wax dropped on the skin. There is no mention of the state of the pupils. After the examination, the body was put in a coffin, still in the wet clothes. Fourteen hours later, on October 29th, the coffin was reopened in order that a lawyer might identify the body. The undertaker's men then noted that the cheeks were coloured blue and that there was a slight movement of the head. The same medical officer was again called and now heard faint heart sounds, but there was still an absence of a pulse and of respiratory movement. The patient was then moved to a hospital, when at 10 A.M. on the 29th—i.e. 42 hours after the poison had been swallowed—it was found that the trunk and limbs were partially stiff, that she was unconscious, and that there was no reaction to stimuli. The double heart sound could be heard over the sternum, the heart beating 30–40 a minute; signs of breathing and of a pulse were absent. Both pupils were markedly contracted. The skin and lips were deadly pale, but the cheeks were bluish (*leicht cyanotisch*). The stomach wash contained morphine; the urine drawn off from the bladder, besides albumin and casts, also contained a small quantity of morphine. Under active treatment for morphine poisoning the stiffness of the limbs began to pas off in two hours; consciousness began to be regained on the 30th. On Nov. 3rd the patient was convalescent and the urine free from albumin. No pneumonia or other complication supervened.

Mr. Spencer aptly quotes Marshall Hall's saying that "hibernation is, in every respect, but the parallel of ordinary sleep, varying only in force and duration."

NOCARDIASIS CUTIS RESEMBLING SPOROTRICHOSIS.

Dr. William H. Guy, of Pittsburgh, reports[1] a case which clinically resembled sporotrichosis, of which over 200 proved cases have been recorded since Schenk published his paper in 1898 on Refractory Subcutaneous Abscesses caused by a Fungus possibly related to the Sporotricha.

The patient was a coal-miner, aged 51, who presented a number of inflammatory nodules and indurated ulcers extending from the base of the left thumb to a point slightly above the bend of the elbow. On inoculation of various culture-media with the contents of one of the unbroken lesions several greyish-white pinhead-sized colonies appeared, which were found to consist of a mass of tangled threads bearing small granules. The organism was therefore identified with that which was originally isolated by Nocard from the superficial abscesses of cattle suffering from farcy. When first seen the patient was diagnosed as a case of sporotrichosis and was given a saturated solution of iodide of potassium. Apart from simple protective dressings, nothing else was done, and uninterrupted recovery took place.

A review of the recent literature on nocardiasis is appended, including the paper by Dr. J. B. Christopherson and Major R. G. Archibald in THE LANCET[2] on primary nocardiasis of the lacrymal gland.

VETERINARY SURGEON AS MEAT INSPECTOR.

THE want of a proper and uniform system of meat inspection in this country is being increasingly felt, while little is being done to select for the position of meat inspector the man most likely to be fitted for it—namely, the veterinary surgeon. His collegiate training includes both a special course and a special examination in meat inspection, and no one knows better the condition and appearance of the organs of animals in health and disease. The matter came before the largely attended representative meeting of the members of the Royal, Southern, and South-Eastern Counties Veterinary Medical Societies, held in London last week, when Mr. James Hayhurst, superintendent and veterinary inspector of the Metropolitan Cattle Market, Islington, read a paper on "The Duties of a Veterinary Meat Inspector," in which he particularly emphasised that in England only the larger towns had any pretence of meat inspection, and that in many places a butcher might, if he liked, offer for sale diseased or unsound meat with little risk of discovery. He drew attention, too, to the necessity for public abattoirs as against private slaughter-houses, and many other points in which Great Britain lags behind other countries in respect to the inspection of foodstuffs. At the termination of the discussion which followed Professor F. Hobday proposed the following resolution, which was carried unanimously, to be sent to heads of corporations and local authorities:—

That in the opinion of this meeting it is essential, for the protection of the public health, that a proper system of meat inspection be arranged; and that the veterinary surgeon, by virtue of his training in the diseases of animals and their flesh, was the best authority to be utilised for the purpose. Also that if public slaughter-houses were erected the cruelty to animals which sometimes occurred in private slaughter-houses would be prevented, and young children would be debarred from being within its precincts.

If the inspection of meat for human food is to be thorough and reliable it must be done by the scientifically trained man.

DOUBLING OF THE SPINAL CORD.

Dr. Benjamin Lipshutz[1] reports a rare variation in the anatomy of the spinal cord encountered during the regular laboratory work in the dissecting-rooms of the Daniel Brough Institute of Anatomy at the Jefferson Medical College. No clinical history of the case was available. The anomaly, which was found in the body of an adult male aged 35, consisted in a bifurcation of the spinal cord beginning at the twelfth thoracic vertebra and extending to the caudal limit of the spinal cord so as to form two independent symmetrical halves. The caudal limit of each half was at the level of the cephalic border of the first sacral vertebra. The conus medullaris of each half was independent, union taking place at the level of the third sacral vertebra into a single large filum terminale which was attached to the dorsal surface of the first segment of the coccyx. The cervical and thoracic portions of the cord were normal. Another anomaly was present in the form of an hour-glass shaped band of dura in the sagittal plane projecting between the two halves of the cord. There was also a number of small, flattened calcareous plaques adherent to the spinal arachnoid. Duplication of the spinal cord is a rare occurrence, only ten undoubted cases having been collected by Bruce, McDonald, and Pirie in 1905. The division usually occurs in the lumbar or lower thoracic segments of the cord. Other abnormalities, though absent in the present case, are frequently present, such as spina bifida, meningocele, and cutaneous or bony malformations.

MALARIA INVESTIGATIONS IN THE MALAY STATES.

SOME years ago a Malaria Bureau was established in the Federated Malay States, but its operations in the past seem to have been hindered by the inadequacy of its staff. It is locally admitted that the malariology of the country is very incomplete, but efforts are now in progress to make good this defect. Owing to the incompleteness of the available information it has been necessary hitherto to exercise great caution in accepting any generalised conclusions. From a recently published report by Dr. H. P. Hacker[2] we gather that efforts are at present being made to place the malariology of Malava on a firm basis, and that now the main object of the work of the Malaria Bureau will be to collect full and accurate data concerning the disease and its various factors throughout the country. No general conclusions will be issued by the Bureau until they can be based upon an incontrovertible basis of facts. With a view to carry out the work we understand that the staff of workers is to be increased, and that from time to time reports will be issued giving details of the information as it is collected. These reports, Dr. Hacker believes, will become objects of reference and may assist other workers in arriving at a more uniform theory and practice of malaria prevention and treatment. In his

[1] Archives of Dermatology and Syphilology, August, 1920.
[2] THE LANCET, 1918, ii., 847.

[1] Archives of Neurology and Psychiatry, July, 1920.
[2] Federated Malay States, Malaria Bureau Reports, vol. i., November, 1919. By H. P. Hacker, M.D., B.Sc. Lond., medical entomologist, Federated Malay States. Singapore. Pp. 76. (Not on sale.)

recently published report Dr. Hacker calls attention to the insufficiency of our knowledge of the relative malaria-carrying properties of the various species of anophelines, and the conditions which control these properties. The pathogenicity, too, of jungle species of these mosquitoes is practically an untouched subject, and stands in urgent need of coördinated research. In the Malay States the most important carrier of the malaria infection seems to be *A. maculatus*, which is found usually in the hilly country; the less dangerous, *A. aconitus* and *A. fuliginosus*, are found in open swampy regions, and *A. umbrosus* in low-lying jungle. There are, of course, many other anophelines in Malaya, but these are among the species that have chiefly to be considered. The felling of jungle and the opening up of wooded ravines have been advocated by some authorities as an antimalaria measure. Experience, however, in the Malay States has shown that such operations require to be carried out with extreme caution. *A. maculatus* does not breed under the shade of secondary growth of vegetation or jungle, but as soon as a ravine is cleared *A. maculatus* appears and begins to breed rapidly, while the less dangerous jungle-frequenting mosquitoes disappear. If the opening up of hill jungle be necessary for the development of a place, Dr. Hacker insists that attempts should be made to keep ravines, which contain practically all the water and therefore all the breeding-places, under the original jungle and thus prevent the access of the dangerous *A. maculatus*. This is only one of the points touched upon by Dr. Hacker in his present report, there are also others of equal interest which can be usefully studied at first hand by those concerned with the problems of malaria. The proposed collection and publication of carefully verified data concerning the disease in the Federated Malay States is likely, in our opinion, to give valuable assistance in the solution of some of the still outstanding problems connected with malaria, a disease which impedes the economic development of many of our colonies and dependencies.

EYE-STRAIN IN KINEMAS.

IN response to an inquiry from the London County Council as to the possible causes of eye-strain in kinemas and the best means of removing them the committee of the Illuminating Engineering Society has now issued an interim report [1] which has behind it the authority not only of that society but also of the Council of British Ophthalmologists and of the Physiological Society, both of which bodies were represented on the committee. The point chiefly dealt with in this interim report is the proximity of seats to the screens. Experience shows that discomfort arises largely through effort involved in raising the eyes to observe pictures presented at an unduly high level, and the recommendation is made that the angle of elevation measured to the top of the picture should not exceed 35°. The kinema headache would appear to have this much in common with the "Academy headache," that both are related to fatigue of the elevator muscles of the eye. A limit to the lateral angle of view of 25° is also recommended. Another definite recommendation is that the illumination of the auditorium, which should be nowhere less than one-fortieth of a foot candle, should gradually be increased from the front to the back of the auditorium. A still more important point is that a definite rule should be enforced that no unscreened source of light should be visible to the observer from any seat in the theatre while looking towards the picture. Other matters touched on but left to be dealt with more fully in future reports are the different varieties of "flicker," film, and mechanical defects, and a possible standard of minimum brightness for the screen. The only reservation made by any members of the committee is by those representing the kinema industry, who draw attention to the absence of evidence of serious injury by eye-strain, and are of opinion that where the recommendation concerning seating would entail serious financial hardship there is no justification for the imposition of the rule recommended. Our own opinion is that here is a matter in which the interests of the public, although not vital, are yet of sufficient importance to justify State or municipal protection.

[1] The Illuminating Engineer, June, 1920.

SYPHILIS SIMULATING SYRINGOMYELIA.

Dr. Walther Blumenthal,[1] of Coblence, records the following instructive case. A lieutenant, aged 22, was exposed to infection in the beginning of September, and developed a chancre three weeks later, which cleared up under treatment with neosalvarsan. At the end of October he complained of both hands feeling dead. On examination dissociated sensory paralysis was found in both hands; in the right more than in the left, corresponding to a small isolated focus in the seventh cervical segment in the neighbourhood of the central canal. There was slight disturbance of tactile sensation in the first, second, and third fingers up to the middle line of the third finger, and perception of pain, heat, and cold was almost completely lost in these fingers. Examination of the rest of the nervous system, including the reflexes, cranial nerves, and fundi revealed nothing abnormal. Lumbar puncture was not performed. Although the initial lesion had appeared only five weeks previously and no secondary symptoms had yet developed the clinical picture suggested syphilis of the cervical cord. Energetic treatment with silver-salvarsan was instituted and the symptoms gradually subsided in the course of three months, during which other spinal-cord symptoms occurred—viz., slight inequality of the knee-jerks and abdominal reflexes—but soon disappeared.

[1] Deutsche medizinische Wochenschrift, August 12th, 1920.

THE METRIC SYSTEM IN THE BALANCE.

IN October, 1916, a Committee was appointed to consider and report upon the advisability or otherwise of the compulsory adoption of the Metric System of Weights and Measures in the United Kingdom. This Committee, presided over by Sir Joseph J. Thomson, was appointed by the Conjoint Board of Scientific Societies, and a report was first prepared in June, 1917; delay, however, ensued through fresh considerations arising, and the report has only now been published. The terms of reference were wide enough to remove the question out of the purely academic sphere and to make it necessary for the Committee to consider the effects in common life as well as in technical manufactures and industries. Briefly, its recommendations covering scientific ground in a wide sense amount to the following:—

That the British system of units of weights and measures be retained in general use in the United Kingdom.

That a definite movement towards compiling statistics in metric units should be set on foot. (This refers chiefly to maps and plans and contours, which, it is held, should be shown in metres and not in feet.)

That while it is not proposed to abolish such units as the mile, the yard, the foot, and the inch, distances should be expressed in miles and decimals of a mile, decimals of a foot, but not in any complex of miles and yards, feet, and inches; that railway charges should similarly be calculated in tons or in pounds, but not in hundredweights, quarters, and pounds, and so on.

That according to the above principle the pole, furlong, and league be abolished, as well as the square rod or perch and rood, all areas of land being measured in acres and decimals, or in square feet for small plots. Similarly, the abolition of the grain, dram, stone, quarter, and hundredweight of 112 pounds is recommended, and the complete abolition of apothecaries' weight.

That the use of the gallon as a general standard of capacity be retained, subdivided for retail use into quarts and pints; that the peck, bushel, quarter, chaldron, and barrel be abolished and measure by weight substituted.

That the use of the metric system be made compulsory with as little delay as possible in the whole trade in fine chemical and drugs, and in all specifications and prescriptions relating to such products.

That no change in the existing system of British coinage be attempted in present circumstances.

With few exceptions the report appears to have been considered favourably by the scientific societies and financial authorities, the former urging the use of the metric system in all scientific work and its introduction into industries, especially those of a complicated kind involving scientific and technical processes. That medicine has been singled out for special treatment by a non-medical committee of reference is a testimony to the

exactness of our discipline and to the open-mindedness of its votaries. The Council of the Royal Society of Medicine strongly endorses the proposal to adopt the metric system in connexion with medical science, and the Council of the Royal College of Surgeons expressed its approval of the recommendations. It will be seen that these recommendations do not bid for uniformity and, if adopted, would leave medicine still with a more or less mixed system of standards. But the use of the metric system in prescribing must result in its adoption for the weight and dimensions of the human body; and the rest would soon follow. It is significant that the chairman, Sir J. J. Thomson, has not signed the report, nor have M. le Duc de Broglie and Mr. Charles P. Sparks. The signatories are Mr. H. Wilson Fox, M.P.; Sir Robert Hadfield, F.R.S.; Mr. A. R. Hinks, F.R.S. (secretary); Sir Philip Magnus, M.P.; the late Professor J. Perry, F.R.S.; Professor W. Cawthorne Unwin, M.Inst.C.E., F.R.S.; and Professor W. W. Watts, F.R.S., secretary to the Conjoint Board of Scientific Societies.

A MILITARY M.O.H. GROUP.

WITHIN the Society of Medical Officers of Health a group is being formed by those members who are specially interested in naval, military, and air-force hygiene. Its formation has the approval and support of the official heads of the medical departments of the Navy, Army, and Air Force. The group will be drawn from the three Services and from their auxiliary forces, membership being confined to medical men who hold, or who have held, sanitary appointments in any of these Services and to those who are in the possession of a diploma in sanitary science, public health, or State medicine. The object of the group is to provide an opportunity for present and past officers of the Services to meet and discuss papers dealing with subjects of common interest as well as to make more close the liaison between officers in the Services and medical men carrying out similar work under civil conditions. Nothing but good can come of such free and informal exchange of views between those who have seen hygienic practice under all manner of conditions, and the deliberations of the group will be watched with attention by those officially responsible for public health. All medical men eligible for membership are invited to communicate with Major W. N. W. Kennedy, O.B.E., Town Hall, Croydon, acting honorary secretary. The subscription to the society, including membership of the group, is £1 1*s.* per annum, which entitles members to receive a copy of *Public Health* each month. The first meeting of the group will be held on Friday, Sept. 24th, at 4.15 P.M., when officers will be appointed, and Brigadier-General W. W. O. Beveridge, director of hygiene at the War Office, will read a paper on Disinfection in the Field.

ATTENTION is directed to the notice in our news columns of a course of post-graduate study for general practitioners at St. Andrews, under the direction of Sir James Mackenzie.

THE constitution of the War Office Departmental Committee to inquire into the expert knowledge derived from the experiences of the late war in regard to shell shock, over which, as we announced last week, Lord Southborough presides, is as follows, the departments which each member represents being added in parentheses: Temporary Surgeon-Lieutenant Thomas Beaton (Admiralty), Dr. J. L. Birley (Air Ministry), Dr. H. J. Bond (Board of Control), Dr. Maurice Craig (Ministry of Pensions), Wing-Commander M. W. Flack or Wing-Commander J. McIntyre (Air Ministry), Dr. H. W. Kaye (Ministry of Pensions), Dr. Hamilton C. Marr (Board of Control for Scotland), Surgeon-Commander E. T. Meagher (Admiralty), Brigadier-General J. G. S. Mellor, Sir Frederick W. Mott, F.R.S., Major A. D. Stirling and Dr. W. Aldren Turner (Army Medical Department), Mr. Stephen Walsh, M.P., Major W. Waring, M.P., with Major W. R. Galwey (secretary).

PUBLIC HEALTH IN SOVIET RUSSIA.

BY L. HADEN GUEST, *M.C.*, M.R.C.S. ENG., L.C.C.
SECRETARY AND PHYSICIAN TO THE BRITISH LABOUR DELEGATION.

II.—THE MEDICAL SERVICES.

THE work of dealing with epidemic diseases in Russia has been carried out by a nationalisation and centralisation of all public health and medical work. The Commissariat of Public Health came into existence at the end of 1917, and controls the services of the army and navy, as well as that for the civilian population. The work of the department is divided into (1) medical and (2) sanitary, (3) a temporary anti-epidemical service. All medical services of any kind whatsoever come under the control of the Commissariat. In theory all medical and dental attendance is free, and in practice free treatment, in so far as it is available with the limited resources at the Soviet Government's disposal, is "accessible" to all free of charge. In fact, alongside of this free system the old system of private practice continues, although only some 10 or 20 doctors in Petrograd are not in the service of the Soviet Government. In Petrograd the acceptance of fees is severely frowned upon, and I heard of a physician in State employ being prosecuted by the Tribunal of the Peoples' Justice for demanding a fee of 1000 roubles, nominally £100. In our money 1000 roubles is roughly equivalent to 2*s.* at present rate of exchange, and will purchase in the open market 2½ lb. of bread, about eight eggs, or about a quarter of a pound of butter. In other towns the taking of fees seems to be regarded less severely. As far as I could gather all hospital or institutional treatment was free in fact.

Owing to the shortage of doctors it is usual for three, four, or more separate appointments to be held at the same time, and the doctor holding them receives a salary for each appointment. A usual monthly salary is 4000 roubles per appointment. The number of doctors in Petrograd, including army doctors, was 1300, about half of whom were women. Doctors are paid salary on a scale varying with (1) length of service, (2) specialist qualifications. Doctors also usually have rooms provided, and very frequently their meals provided also. I was told that sometimes doctors receive not only the salary for each separate appointment held in money, but also the rations for each separate appointment in kind. One doctor told me that extra bread came in useful for paying cab fares. There are a few droshkies still available in the streets; the fare for a short distance in Moscow, for instance, being 2000 or 3000 roubles. But the "isvostchniks" (drivers) prefer to be paid in kind. Small tablets of soap are a useful kind of small change to carry about.

Organisation in Petrograd.

The organisation in Petrograd consists of a central town public health service under the control of the Petrograd Health Department, who are all Communists. At the head of this is Dr. Pervouchen, who was careful to explain to me that he held his appointment, not as a doctor, but as a Communist and a representative of the workers. Under this central department are the ten districts (rayons) into which the town is divided, each district having its own health department. Sick persons able to attend as out-patients go for medical treatment to one of the town clinics, and if they do not know where to apply can get information at the district headquarters of the health department. Those needing to be visited at home send a message to the district headquarters and a doctor calls at the house. I was told that all cases requiring hospital treatment are transferred to hospital by the ambulance service under the control of the town.

I personally inspected a parade of this ambulance service, which was under the command of Dr. Haffkine (nephew of Dr. Waldemar Haffkine). The organisation was military, and the personnel consisted largely of medical students. It has been created by the Bolsheviks. This transport service, however, discharges several different functions, and provides

(*a*) first aid by doctors in case of accident and emergency; (*b*) transport of cases to hospital; (*c*) transport of infectious cases to hospital, and disinfection and repair in the homes of infectious cases removed to hospital. I saw myself a large number of motor ambulances and horse ambulances and one steam tram ambulance, as well as closed wagons for transport of clothing and bedding for disinfection. At the special parade which took place in the grounds of a large hospital the personnel of the corps gave a display of stretcher drill in which they were quite reasonably proficient. Mistakes and awkwardnesses were apparent, but were of exactly the same nature as those made by any ordinary field ambulance on nervous occasions. The clothing of the personnel of the corps was good, close fitting coats and breeches of leather for the majority and good boots. The heavy losses from infection suffered by doctors and sanitary personnel have made the authorities very careful of the lives of those doing this dangerous work. Doctors engaged in infectious diseases work are paid 80 per cent. more than others, and get rations on "Red Army" or highest scale. Nevertheless, 50 per cent. of doctors so employed have died from typhus and other infections. The statistics regarding number of persons employed on this first-aid and transport service in Petrograd I give as they were stated to me by Dr. Pervouchen: Doctors, 40; sanitary instructors (medical students), 36; motor ambulances and motor-cars, 104; horse vehicles (expropriated private broughams are used as well as ambulances), 189; trams, 10; steam tram, 1; sanitary wagons, 5. The cars, wagons, &c., I saw were in workmanlike condition. The horses were in reasonably good condition. The total number of personnel engaged in disinfection duties was given as 1017, which included 360 trained sanitary men to carry out disinfection and subsequently repair any damage done. This insistence on repair of damage was for the purpose of cultivating good feeling and so facilitating disinfection.

Hospitals: A New Institute of Radiology and Rontgenology.

During the height of the typhus epidemic last winter many temporary hospitals were opened for treatment of this disease. Many ordinary hospitals (about 100), however, had to be closed on account of absence of coal and wood for heating, and consequent breakdown of

FIG. 1.—The new Institute of Radiology and Rontgenology in Petrograd.

water and sanitary arrangements. As, however, the population has decreased from 2,500,000 to about 1,000,000 (probably 800,000), the decrease matters less than it would have done formerly.

A new Institute of Radiology and Rontgenology (see Figs. 1 and 2) has been erected under the medical control of Dr. Nemenoff, President of the Institute. This institution combines a hospital with a scientific research department, and is publishing some of its results at present. I saw these research laboratories as well as the wards, and the work was going on quite satisfactorily except for the lack of Coolidge tubes. A special factory for repairing and remounting of X ray tubes has been erected in Petrograd in connexion with the Institute. I was told—by a junior house surgeon speaking English and French—that whereas the discipline in the hospitals at the beginning of the Revolution was very bad, it was now "like old times."

The only other medical institutions I saw in Petrograd were a clinic for the study of defective children, in which they were specialising in rather elaborate studies of mental defect, and a "first-aid" hospital for emergency cases. All three of these were far above

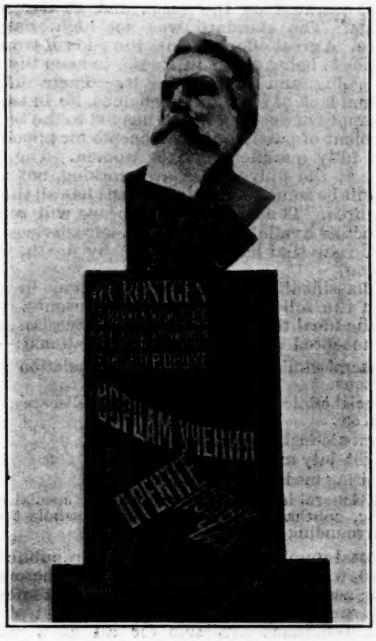

FIG. 2.—The monument to Rontgen in the forecourt of the Institute. The names on the plinth are: W. C. Rontgen, C. G. Barkla, W. H. and W. L. Bragg, M. Laue, A. Sommerfeld, H. G. J. Moseley, P. Debye, M. Sklodowsky-Curie, H. Curie, H. Becquerel, E. Rutherford, W. Ramsay, W. Crookes, J. J. Thomson, P. Lenard, H. A. Lorentz, C. T. R. Wilson, Millikan, M. Planck, N. Bohr.

the average level of Russian hospitals, but I did not have an opportunity of seeing a normal hospital in Petrograd owing to the necessity for attending a tremendous military and naval review got up in honour of the Labour Delegation. The mortality of children in hospital (up to 12 years) was given as 24 per cent. The birth-rate was said to be rising rapidly. The figures of 40,000 births per annum were given for the pre-war Petrograd of 2,500,000 people, and a present number of 20,000 to 25,000 births per annum for the present Petrograd of about 1,000,000.

Arrangements in Moscow.

In Moscow the medical arrangements were rather different. Free treatment was available, but fees appeared to be paid pretty openly to doctors and dentists. And all institutions were centralised and not arranged in districts, nor was there apparently a district health organisation in addition to the central town organisation. A hospital at the Kremlin, where the chief Government offices are, was well equipped with medicines, but the resident doctors were only partly qualified. The arrangements were otherwise passable. Two town hospitals inspected were badly arranged, badly disciplined, and, in the typhus block, dangerously dirty, no disinfection and little washing having been attempted. These two hospitals were indicated to me by non-official persons as "normal" samples of Russian institutions. The beds were largely without linen and mattresses and the very poor blankets provided were dirty and insufficient. The surgical wards, however, were very much better than the medical. The doctors looked ill, half-starved, and terribly depressed. An

eminent physician I met could not be induced to believe that England might lift the blockade and allow medical and other supplies to come through. He was a very sad, unsmiling, and bowed man. Other medical institutions seen in Moscow were much better, the special clinics lately established being on more modern lines.

Medical Service in Country Districts.

In addition to Petrograd and Moscow, I saw hospitals at Saratoff on the Volga and at Beresnaki on the Volga. The standard was not high, but it was adequate. A great effort against the odds of tremendous difficulties is being made in Russia to keep the medical service going and to improve it. Their difficulties, apart from lack of soap and medicines, lie in the failure of the supply of doctors, which has led to the temporary employment of partly qualified people for appointments needing fully qualified men or women. The medical faculties at the universities are working, but not well, and it will be some time before Russia has all the doctors she requires. The conclusion of peace will render the army doctors available, but even their services will not fill up the gap that has been made by death, war, and revolution.

The classification of medical institutions in Russia is given in the following list, which represents, however, rather the ideal than the achieved (no Russian statistics can be accepted without serious reservations):—

(1) General clinics for areas with a population of 2000 to 3000 persons.

(2) Special clinics for eye diseases, skin diseases, venereal diseases, &c.

(3) First-aid institutions.

(4) Night-duty medical service.

(5) Visiting medical service.

(6) (*a*) General hospitals for regions; (*b*) special hospitals (obstetric, ophthalmic, &c.) which serve whole towns and their surrounding villages.

The total number of hospitals in the republic is given as 10,000, with about 270,000 beds, 17,000 doctors, 35,000 medical assistants, and 120,000 junior medical staff. Medical arrangements for the country aim at making medical assistance available for all at a maximum distance of five versts. In pre-revolutionary Russia the distance was often 20. Progress has already been made in the direction desired, notably in the Poltava government.

The nationalisation of medical service has, of course, extended to health resorts, the places available for treatment being usually allotted by the Central Commissariat of Health, except in the case of institutions of purely local importance. During 1919, 5000 patients were so treated, and they were no longer the old-time patrons weighted with over-generous living. The distribution of patients at Lipetz in the Tambov government is given as Workers and Soviet officials, 70 per cent.; Red Army, 25 per cent.; other citizens, 5 per cent. Board, residence, and treatment are all free at these institutions.

(To be continued.)

HOUSING NOTES.

The Labour Housing Association.

THE Labour view on the shortage of houses was ventilated at Portsmouth on Sept. 4th, when the Labour Housing Association held its annual meeting. Much of Mr. Thomas's speech might have been uttered on behalf of the Ministry of Health; as when he pointed to the influence of bad housing on political unrest or advocated increased transport facilities to combat overcrowding. But the resolution condemning the Government had no constructive suggestion and criticisms of the Ministry's housing standards carried no particular weight. Some interesting figures were given by Mr. George Hicks, secretary of the Bricklayers' Union, who announced that out of 54,000 bricklayers only 7000 are engaged in house construction, while of all building trade operatives less than 10 per cent. are so occupied as compared with 40 per cent. before the war. This is an intolerable state of things.

Building in Concrete.

Among the methods favoured by the Ministry of Health for the reduction of the cost of building is the use of alternative materials of construction to the orthodox brick and mortar. Amongst the various substitutes hollow concrete blocks are, perhaps, the favourite. A bungalow built on the Clifton-Ewart system has just been put up at Nottingham. The chimney stacks are of brick, but in later models these will, no doubt, be replaced. The rest of the skeleton is composed entirely of concrete blocks. No wood has been used except for doors and windows. The bungalow, which was built in three weeks and could by intensive work have been completed easily in half the time, contains four good-sized rooms, bathroom, and lavatory, and when the subsidy has been deducted the cost will be £300. No doubt such bungalows could be built more cheaply, as, for example, by the employment of unskilled labour. But it is premised that any attempt to cheapen housing construction will be rendered void by the interest vested in the brick. Every builder is dependent on the good-will associated with the brick, for though he might build his walls with non-union labour he would be unable to find plumbers, carpenters, or electricians to complete the work. So it comes about no one can afford either to use bricks or to do without them. In the meantime, the unskilled man remains unemployed and his children are crowded ever more and more into the insatiable slums.

Standards of Accommodation in Herefordshire.

Some time ago the Ministry of Health suggested to medical officers that the housing section of their annual reports should be issued as a separate document. Among others Dr. Herbert Jones, M.O.H. for Herefordshire Combined District, has complied,[1] and a comprehensive survey of present housing conditions is the result. In half of the parishes more houses are needed, and the schemes submitted to the Government, even were they completed at the present day, would not meet this need. As regards the standard of accommodation, Dr. Jones would have each house built on a quarter-acre plot and to contain parlour, kitchen, washhouse, scullery, bath, and three bedrooms. By discussing the question at "women's institutes" and other organisations he has discovered a unanimous opinion in favour of both parlour and bath. The latter is wanted even where water cannot be laid on, the women being more anxious that the bath should be easily emptied than that it should be easily filled. He adds that there are old-age pensioners occupying houses larger than they need, and hints that if convenient houses—presumably with less than three bedrooms—were provided for these their present dwellings would become available to larger families.

A Tragedy at Wandsworth: No Room for the Baby.

An occasional incident of human interest serves sometimes to bring home the importance of impersonal political movements. Such an incident was provided at a London police-court, when a man was recently charged with aiding and abetting his wife, aged 28, to kill herself. The woman died, it was said, as the result of an illegal operation, and the evidence showed that her wish to avoid the birth of a child was due to her inability to find a house which would provide it with a decent home. We agree with the magistrate that a full realisation of the price which our fellow citizens are paying in suffering and disease would help considerably those who are now negotiating to find some speedier way of settling their differences and of proceeding with the rapid delivery of houses.

[1] Annual Report, 1919, issued August 20th, 1920.

SCARLET FEVER IN MANCHESTER.—Seventy-five cases of scarlet fever were reported in Manchester last week, as against an average of 60 during the six preceding weeks. There are four cases of small-pox in the Clayton Hospital, but no new cases have been notified in Manchester during the past fortnight.

HYGIENE ON THE SEA:

ACCOMMODATION FOR SEAMEN IN SHIPS OF TO-DAY.

(BY OUR SPECIAL CORRESPONDENT.)

I. THE "AQUITANIA."

THE *Aquitania*, of 45,647 tons gross (this is her sea-going loaded weight), with the black tops of her four red funnels soaring to the skies, looked huge as one approached her in the docks at Southampton. And a big ship she is—over 300 yards long, with 97-ft. beam, and a load-draught of water of 35 feet. She is fast, too, for her oil-driven turbine engines, with their 56,000 horse-power and their four screws, give her a speed of 23 knots, or 26 land miles per hour. When the Cunard Company was good enough to send me on board she was in the usual turmoil of a ship the day before going to sea, when all kinds of stores are coming on board, strangers are flocking to and fro on business, and, in spite of these strangers and the dirt they are bringing on board, every endeavour is being made to get the ship thoroughly cleaned. At such a time, seeing she is alongside a wharf with big sheds that keep the wind off her, a ship is so hot that one feels she should be taken out into the stream and anchored for a night to get aired and cool before her passengers arrive; but that is a counsel of perfection. They are many, these passengers, 750 first-, 900 second-, and some 2000 third-class, and with her officers and crew her captain has the responsibility at sea for the lives of some 4000 souls.

Comfortable Accommodation for Passengers.

The company is doing what it can to make them all as comfortable as they can afford to be. There are suites for millionaires with sitting-rooms and bedrooms, smaller cabins for the less wealthy, all in the first-class section having fixed basins and hot and cold water laid on. In the third-class there are folding wash-stands and the furniture is less magnificent, but the beds are good. For the first-class passenger there is a beautiful saloon, a grill-room, too, a magnificent smoking-room, lounges, a swimming bath, and a gymnasium. The second-class saloon is very bright and comfortable. These saloons have chairs, and that shows the company has confidence that the steadiness of the ship and the deep pile of the carpets make it certain that in no weather is there fear that the rolling of the ship will seriously incommode the passengers. Not till we come to the third saloon do we find the fixed pedestal, rotating seats that we all know at sea. There are pianos for every class of passenger.

The medical officer on duty received me, but as he was for the moment busy I was taken round the ship by the dispenser, formerly a chief sick-berth steward in the Royal Navy, and under his capable guidance I saw how the practice of hygiene is improving at sea. There are three hospitals in this great ship, and in each 12 beds. One hospital for men, with the dispensary and operating-room adjacent, and another for women; a third, distant and well isolated, is for infectious diseases. Besides the dispenser and his mate, there are two female nurses on the staff.

The System of Ventilation.

The ship is, of course, artificially ventilated. In fine or moderate weather the numerous side ports are open. There are some in dangerous positions which are fitted with Utley's patent water-excluding side lights, which permit ventilation in all weathers. But never can enough air for so many people pass naturally in and out of so large a ship. Accordingly there are everywhere between decks, in cabins, saloons, and lobbies, in bath-rooms and water-closets, trunks or conduits for forced ventilation, carrying in fresh air or exhausting the foul. And as cold air might chill the inhabitants and cause complaints there are fitted in the ship 36 thermo-tanks, which heat the air before it is introduced into the ship. The ventilation of a ship is a complicated problem, and it is said on board that the currents in a ship cannot always be made with advantage to run constantly in the same direction; accordingly these thermo-tanks and their fans are fitted so that they may be driven either direct or reversed; that they may be used alternatively as supply or exhaust ventilators. This is, I think, to be regretted. Trunks are hard to clean, and an exhaust trunk is apt to accumulate some dust, and when the current is reversed some of that old dust is carried out. An epidemic of sore-throat has been attributed to this cause. Generally fresh air is supplied to cabins and passages, while lavatories, &c., have exhausts. Water-closets are in such a ship so high above the water that shore patterns are used, with a strong flush from a sanitary tank of sea water.

The Crew's Quarters.

But readers of THE LANCET will specially desire to know what improvements there are nowadays in the accommodation of the crew. The *Aquitania*, a hospital ship in the war, has since the war been completely refitted, and advantage has been taken of this opportunity to remodel all the berthing arrangements of the crew. Certainly they are very different from those the writer remembers in the *Campania* of the same line, when she was the greyhound of the Atlantic. The stewards are berthed amidships, the seamen and firemen forward. Most of the stewards live in large dormitories with double-tiered iron beds all round, while the seniors have one, two, or three berthed cabins. The seamen and firemen have small cabins each holding three or four men; and what different places they are from the old forecastle! I estimated one of these cabins, for two men, as 9 ft. high, 9 ft. long, and 8 ft. wide, 728 cub. ft., giving each man, not the 120 cub. ft. required by the law, but 300 cub. ft. of air space, and there was besides an air trunk and a 10-in. side port. 120 ft., be it remembered, is all that the Merchant Shipping Act requires. The rest is supererogation. There was in this cabin an exposed iron beam; that it had no insulating cork-paint made me anxious, but I was assured that the ship was kept so warm by steam-radiators that even a naked iron beam like this did not sweat. There was a little cabin, also a mess place, for the four boys who do duty on the bridge, and if only boys could go on always serving in the *Aquitania* there would be little hardship in a seafaring life beyond the weather. There are large mess decks for the seamen and firemen, well warmed and well lighted, with tables for their food and benches to sit on. Not least of the benefits is it that the men do not have to prepare their dinners, nor do they get them cooked by an inferior cook, for all their food is drawn from the ship's galley where the large staff of cooks prepares food daily for some 4000 people. Compare all this with accounts of the merchant seaman's lot even 10 years ago!

Stewards and their Meals.

But I saw no mess places for the stewards. In the *Campania* 15 years ago many of the stewards and stewardesses sat down to meals in the saloon after the passengers had finished, and it was a pleasure to see them comfortable. Consequently, I was disappointed to find that in the *Aquitania* the company have gone back to the evil custom of giving the stewards good food, indeed, but no table at which to eat it. It always pains me when I am travelling by sea to observe the stewards standing up to their meals at the pantry counters; not only the position but the oppressive heat must tend to wear them out and prevent the companies from getting their best service. I am sure that with a little consideration the company can better this hardship, which is far from inevitable.

The *Aquitania* no longer burns coal, only oil. That also makes for the comfort of the crew. I noticed there seemed few baths for firemen, and asking a fireman who was by if there were others, he told me baths were less necessary now, the work was so clean; indeed, it was unnecessary to change your clothes at the end of a watch in an oil-fired stokehold. Oil has enormously improved the comfort and status of the

fireman. By lessening his numbers it has made room in the ship for allotting greater space to the crew individually, and for increasing their comfort, as I have said.

My thanks are due to the company, and to the various officers of the ship, who, themselves very busy, yet made a little time to show me everything, and to answer courteously all my many questions.

UNEMPLOYMENT INSURANCE

IN RELATION TO NATIONAL HEALTH.

THE Unemployment Insurance Act, 1920, has received the Royal assent, and will come into operation on Nov. 8th. Public attention has been so much occupied with foreign politics and with domestic problems of more immediate interest, or making more insistent claims for consideration, that the passage of a measure affecting a vast number of employers and employed persons will perhaps only be realised by many of these when they find themselves called on to pay their contributions under it. Many such will have forgotten that the National Insurance Act, 1911, not only introduced a compulsory system of health insurance, but also provided, more or less experimentally, for compulsory insurance against the ill-effects of unemployment in certain scheduled trades. Presumably the experiment has been found to be successful, for the new Act extends compulsory insurance to substantially all persons for whom health insurance contributions have now to be paid.

Persons Exempted from the Act.—Employers' Contributions.

Outworkers, agricultural workers, and persons in private domestic service are exempted from its operation, as are also certain classes of employed persons whose rights and conditions of employment render such insurance unnecessary in their case. These, however, are for the most part persons excepted from the operation of the Health Insurance Acts. Under the Unemployment Insurance Act workers over 70 year of age will be insurable, except in the case of old-age pensioners, who are excluded both as regards contributions and benefits. Even with the exceptions enumerated above it is estimated that about 8,000,000 persons will for the first time become insured against employment, making up the total of those so provided for to 12,000,000. Clerks and other non-manual workers will note that they are included if their remuneration does not exceed in value £250 per annum.

The contributions of employers will range from 4*d.* per week for men over 18 years of age to 2*d.* for girls between 16 and 18, and the employee will contribute from 4*d.* to 1½*d.* according to age and sex, payment being made by special stamps in the manner with which health insurance has made all familiar. Benefits will be 15*s.* per week for men, 12*s.* per week for women, and half the full rate for contributors under 18 years of age. The Act provides further for certain returns of contributions at the age of 60, and for the substitution of special schemes giving equal or superior advantages with the approval of the Minister of Labour.

Interdependence of Health and Unemployment Insurance.

Outwardly the connexion between health insurance and unemployment insurance is not close, and when the original Act of 1911 was passed many objected to the inclusion of two subjects apparently disconnected and both of great national importance in one measure. Both health insurance and unemployment insurance, however, have as their object, or as one of the objects for which they have been brought into being, the provision of a means of existence for workers who from temporary, if disconnected, causes are unable to earn their living, and for those dependent upon them. If we consider the matter from this point of view we see at once that there is a hardship affecting an unemployed worker when he finds himself deprived of the means of buying bread for his children through no fault of his own, and when he sees a neighbour equally with himself deprived of wages, equally with himself not responsible for his plight, saved by a provision of the Legislature, at any rate, from the urgent pressure of hunger. There is also the more important consideration of the inexpediency, from a national point of view, of allowing the worker, his wife, and his children to deteriorate physically during those periods of enforced idleness which appear to be inseparable from industrial employment. The maintenance of the nation's health is one of the first, if not the first, duty of those who govern it, and is a duty receiving year by year a fuller measure of recognition. Under the Insurance Acts it will be the joint care of the recently constituted Ministry of Health and Ministry of Labour, the latter contributing its share by attending to the case of the wage-earner who is incapacitated as such though enjoying his full bodily health.

Sir John Simon's View.

Sir John Simon, then Solicitor-General, in an introduction contributed by him to Mr. Orme Clark's treatise on National Insurance, called attention to this interdependence of health and unemployment insurance, though not quite in the above sense, describing the inclusion of the two in a single Act of Parliament as due to an overwhelming reason of practical convenience. He pointed out that it was a necessary condition for receiving unemployment benefit that the unemployed person should be "capable of work," and that the condition for receiving sickness benefit was that the candidate for it should be "incapable of work." He evidently regarded it as likely that if one form of insurance came into being before the other there would be a temptation to make unjustified claims upon the fund first set up. It had been at one time proposed to make unemployment insurance antecedent to health insurance, but to have done this, Sir John Simon apprehended, would have made the man who lost work through ill-health find it to his advantage to declare himself sound, which is obviously undesirable. The two halves of the new scheme of insurance, he therefore submitted, ought to work side by side, the sharp distinction referred to between the conditions to which the different benefits attach being carefully drawn and maintained.

Practical Importance of the Combined Measures.

Looking back thus on the words written by a law officer of the Crown nine years ago we can safely infer that so far as the Government of that day was concerned the association of unemployment insurance with health insurance was designed and was recognised as of practical importance, and also that the extension of the former has only been delayed by the war. Having regard also to the fact that the present Prime Minister was mainly responsible for the introduction of national insurance in 1911, we look upon the Unemployment Insurance Act of 1920 as evidence of his satisfaction with the result of national insurance carried out upon the administrative lines which he laid down. The experiment of unemployment insurance has now been made on a comparatively small scale in the building, shipbuilding, and a few other trades. Experience on a far larger scale has been gained in health insurance, for the value set upon which in the public estimation the medical profession may regard itself as mainly responsible. Without public appreciation of the success of health insurance viewed as a whole it would hardly have been possible for any government to introduce another widespread measure of insurance, dependent for its funds upon a system of weekly contributions. We cannot forget that that system was at first chidden almost universally as irksome, unnecessary, and wasteful of time, but it now appears to be accepted as part of the nation's life on account of the results achieved. We look forward to similar acquiescence in the exactions, as at first they may be considered, of unemployment insurance, and to results in the maintenance of the public health, supplementary to and not less important than the results to be achieved by it in modifying and allaying social unrest.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Local Authorities and the Public Health.

THE deadlock which has arisen between many of the recently elected local authorities in Ireland and the Local Government Board is likely to cause serious interference with public health work. These authorities in which there is now a Republican majority—and they are very numerous—have, in the main, decided not to recognise the authority of the Local Government Board or to submit their minutes or books for the inspection of that body. The Government has replied by refusing to pay any grants to such recalcitrant bodies. Among the grants payable by the Treasury are half the cost of the tuberculosis service and three-fourths of the cost of the service for venereal diseases. It is likely that both these services will be seriously curtailed, if not completely stopped. It is understood that the Dublin Corporation has already decided to close its tuberculosis dispensary, hospital, and sanatorium, and it is probable that other authorities will have to follow its example. There are inconveniences in living in a country with two de facto governments, each ineffective, and neither recognising the other.

Abolition of Coroners' Inquests.

The *Dublin Gazette* last week contained a proclamation under the Restoration of Order in Ireland Act (1920), prohibiting the holding of coroners' inquests on dead bodies in ten counties of Ireland and in the county boroughs of Cork and Limerick. This step is said to be "for the purpose of securing the restoration and maintenance of order." Any inquests required to be held are to be held by a court of inquiry under the Army Act. It is to be regretted that the Lords Justices have considered it necessary to take this step. It is true that in many cases the coroners' courts, like the other courts of the King, have been unable to function. It has been impossible to find either jurors or witnesses. In this they are in the same case as the ordinary courts of assize. In some cases, too, juries have brought in verdicts which did not seem to be justified by the evidence. On the other hand, many juries have discharged their duties with courage and complete honesty, and their verdicts have a sanction in public opinion which a military court of inquiry cannot have. It must not be forgotten, too, that in many cases sudden death, calling for inquiry, has been due to military action, and the public is not likely in such cases to have much confidence in the impartiality of a military court.

Belfast Water-supply.

The Belfast Water Commissioners have decided to ask tenders for the construction of a great storage reservoir in the Silent Valley, a district high up amid the Mourne Mountains, and not far from the famous County Down golfing centre, Newcastle. Up to the present time they have had to depend on intermittent flows of water obtained from the Annalong and Kilkeel rivers in the Mourne range of mountains, supplemented by the enlargement of Lough Strannagh in the Kilkeel river catchment; but what is wanted for a big city like Belfast is a much larger and more regular daily flow of water all the year round to meet the growing demands for water by the citizens of Belfast and the inhabitants of the surrounding districts, and hence the immediate construction of a great storage reservoir right up in the Mourne Mountains, is what is now contemplated. This new reservoir, when completed, will have a storage capacity of 3000 million gallons and a tap-water area of over 250 acres, and it will by itself hold more water than all the existing reservoirs in the Woodburn and Stoneyford Belfast catchment areas at present in use. To many people the uselessness of constructing aqueducts from Belfast to the Mourne Mountains—a distance of over 20 miles—simply to tap a couple of rivers (the Annalong and Kilkeel) without any storage has been apparent, but now the making of a really large reservoir is to be begun.

Sept. 7th.

ROUMANIA.

(FROM OUR OWN CORRESPONDENT.)

Danger from Ice-creams.

AN important measure has been passed during 1920 dealing with ice-creams manufactured and offered for sale in Roumania. The ordinary method of making ice-cream as sold in the streets is to boil milk with or without the addition of some form of starch, together with a certain quantity of eggs, sugar, and flavouring. This mixture is allowed to cool naturally and afterwards is frozen. The cooling may take place under most unsavoury conditions, for instance, in a crowded living room, a disused (and unclean) outhouse, a confined and dirty back-yard, or even a scrap-heap; whilst, in addition, the surroundings among which the ingredients are mixed in some instances baffle description. Added to all this, the vendors and makers are generally Turks or Italians, whose ideas of cleanliness, whether personally or otherwise, differ materially from the here so much desired "western standard." Bearing these facts in mind it will readily be conceded that the ice-cream when sold may be contaminated in such a way as to be a danger to the consumer. To minimise this danger the board of hygiene have given orders for the control of the manufacture of ice-cream and other similar commodities. These must not be manufactured, sold, or stored in any cellar, shed, or room in which there is any inlet or opening to a drain, or which is used as a living- or sleeping-room. Special precautions must also be taken against infection or contamination of the ingredients used in the process of manufacture.

"Ptomaine" Poisoning from Meat.

A sharp outbreak of what would at one time have been labelled ptomaine poisoning occurring at Czernovitz in July has been carefully investigated, and the conclusions arrived at are of scientific interest. The outbreak, which affected 42 persons, of whom three died, was due to the *Bacillus enteritidis*, which gained entrance into pork sausages made on July 12th through the fæcal pollution of the meat. The meat was left in the chopping-house in open vessels, and was contaminated from the large intestines of pigs which were brought into and cleansed in the chopping-house while the chopped meat was waiting for the next process in connexion with its conversion into pork pies. The practical lessons to be learnt from this outbreak are (1) the necessity for absolute cleanliness in all branches of sausage preparation so as to prevent the meat becoming infected; (2) the desirability of baking or cooking the sausage before use so as to raise it to a temperature sufficient to cause the death of any bacteria with which it is liable to be contaminated. In connexion with these preventive measures it is obvious that sanitary authorities should have powers to make and enforce regulations in regard to the preparation of pork sausages and pies, as well as that of many articles of food, thereby guaranteeing the constant supervision of all processes incidental to such trades. In the Czernovitz cases the symptoms were rapid onset, shivering, giddiness, headache, vomiting and diarrhœa, drowsiness, and extreme prostration. The incubation period varied from a few hours to a few days, and the patients either died or had a protracted convalescence; seven of them recovered only after six to eight weeks' illness.

Dust and Smoke Prevention.

The Bucharest City Council for Sanitation recently held a special meeting on the question of the dust and smoke nuisance. They emphasised the importance of dust collection and removal, and the need for municipal cleanliness in its widest sense. Roads should be made of hard and practically impermeable paving in thickly populated districts, instead of with defective stone and ordinary wood blocks; hoses should be used on all courts and alleys and small streets; and damp dusters should be used both in private houses and in public institutions. The problem of smoke and its preventives was also discussed.

Bucharest, August 15th.

Public Health.

ANNUAL REPORT FOR 1919 OF THE MEDICAL OFFICER OF HEALTH FOR NORWICH.

Dr. H. Cooper Pattin in his report gives the estimated population of the city as 124,997, and the area in statute acres 7923. The birth-rate for 1919 was 16·35 per 1000, which was below that of the 96 great towns (19 per 1000). The gross recorded death-rate was the same as the average of the 96 great towns—13·8 per 1000. The infantile mortality-rate among legitimate children was 78·4, and for the illegitimate 166·7 per 1000 births—a striking contrast. The zymotic death-rate was 0·32 per 1000. The comparative mortality figure was rather lower than that of the country as a whole—928 as against 1000. There was only one death from enteric, and the cause of the enteric fever cases does not appear to have been either overcrowding or bad drainage. However, in 84 per cent. of the affected houses the food of the family was stored in an unventilated receptacle in the actual living-room, and 84 per cent. of the affected dwellings were within 20 yards of a sewer grating or gulley. 25 per cent. of the cases clearly recollected having consumed shell-fish prior to the attack. There were 140 notifications of phthisis and 79 of other forms of tubercle. 108 deaths were certified as due to pulmonary and 43 to other forms of tuberculosis, making a total of 151 deaths from tubercle, a figure much below the average of the last 25 years (221 deaths per annum). Dr. Pattin considers himself entitled to affirm that a diminution in the amount of tuberculous diseases is taking place. He says that he has long placed first in importance in the treatment of these diseases not houses, helpful as good houses are, but nutrition, and he confidently anticipates a further lessening of the amount of the disease among working people, proportionately with improvement in income, housing, and, above all, food. Other measures of great importance are the offer of gratuitous disinfection of all rooms in which a person has died from tuberculous disease, detailed instruction as to home treatment of affected persons, and the sorting out of tuberculous children. The Norwich City Council has appointed Dr. Theodore Fisher as tuberculosis officer, and only awaits the sanction of the Ministry of Health for the proposed site of their tuberculosis dispensary. It is also proposed to establish, in conjunction with the Norfolk County Council and the Borough of Yarmouth, a sanatorium and training farm at Stanninghall, near Norwich, where 700 acres, with farm buildings, and a farmhouse which makes quite a good administrative centre, have been procured and turned over to the joint committee by the Red Cross Society. A start has been made with a temporary pavilion accommodating eight males. An open-air school for children has also been inaugurated.

Housing conditions.—The total number of houses in the city is estimated to be nearly 30,000, and of these some 25,000 are occupied by the working classes. Compared with other large towns, the general character of the housing is fairly good, especially of the more modern dwellings, and there are many small gardens. Out of 5809 houses for the working classes inspected in 1919, 106 were overcrowded in respect of cubic space per head, and 458 had more than two persons per room. The health visitors paid 19,550 visits and revisits to houses, 5822 of them in connexion with medical inspection in the schools. They found in the dwellings visited 1801 sick persons. At their suggestion 95 houses and 238 persons were cleansed. The health visitors paid 2217 visits to the homes of the tuberculous, and found that 31·9 per cent. of affected persons had a separate bedroom, 14·1 per cent. had a separate bed in a double-bedded room, and no less than 54 per cent. shared a bed with another person. Dr. Pattin considers that about 4000 unfit houses will need to be replaced if a decent standard of comfort and accommodation is to be enforced. The council puts forward a scheme which has been approved by the Ministry of Health providing for the erection of 1200 new houses, and is making strenuous efforts to get these provided, but there are great difficulties owing to the cost and scarcity of trained labour and materials. It is hoped to procure the erection of 500 houses by the end of March, 1921.

School medical work.—11,674 children were inspected in the schools, and there were 453 re-examinations. 2498, including 589 cases of ringworm, were found to need treatment, and at the end of the year 2169 had received it. In some cases treatment was delayed by the advice of private doctors, and in others not undertaken; this was notably the case in dealing with adenoids and tonsils. At the dental clinic 4339 children were attended to. 1197 damaged permanent teeth were repaired with fillings, and 4165 teeth were extracted. One dental officer is not, however, considered sufficient to cope with the work amongst 19,000 children.

On the whole, Norwich may be considered a healthy city to dwell in, especially in comparison with other manufacturing towns.

"The chief occupations of such of its inhabitants as have to labour for their livelihood," says Dr. Pattin, "are boot-making, mustard and starch making, brewing beer, galvanising iron-wire, motor-engine and aeroplane construction; cocoa and aerated water production; banking; life, fire and accident insurance; teaching and preaching. The boot-making industry contributes a noticeable amount of phthisical cases, especially amongst the 'clickers'; I attribute this largely to the bad mechanical attitude imposed upon these workers—stooping with arms forward and chest cramped and retracted, and also to the apparent tendency of the less robust to drift into this branch of business."

The soil of the city is of a porous character, the higher levels being made up of glacial beds, through which the valleys have been excavated, exposing at their margins the crag formation and chalk, gravel, and alluvial deposits occupying the lower ground. The climate is relatively dry and bracing, and the rainfall low.

URBAN VITAL STATISTICS.

(Week ended Sept. 4th, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had been 9·4, 9·9, and 9·9 in the three preceding weeks, rose to 10·0 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 9·7 per 1000, and coincided with that recorded in the previous week, while among the remaining towns the rates ranged from 4·2 in Gloucester, 4·8 in Gillingham and in Dudley, and 5·1 in Aberdare, to 15·4 in Ipswich and in Sunderland, 15·9 in South Shields, and 17·7 in Exeter. The principal epidemic diseases caused 255 deaths, which corresponded to an annual rate of 0·7 per 1000, and comprised 171 from infantile diarrhœa, 37 from diphtheria, 19 each from measles and whooping-cough, 8 from scarlet fever, and 1 from enteric fever. The deaths from infantile diarrhœa, which had increased from 87 to 150 in the four preceding weeks, further rose to 171, and included 34 in London, 20 in Hull, 10 in Liverpool, and 6 each in Sheffield and Sunderland. The mortality from the remaining diseases showed no marked excess in any of the large towns. There were 2402 cases of scarlet fever and 1404 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 2266 and 1391 at the end of the preceding week. The causes of 30 of the 3427 deaths in the 96 towns were uncertified, of which 7 were registered in Birmingham.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 12·3, 10·8, and 11·1 in the three preceding weeks, declined to 9·8 per 1000. The 206 deaths in Glasgow corresponded to an annual rate of 9·7 per 1000, and included 6 from infantile diarrhœa, 4 from whooping-cough, and 1 from diphtheria. The 55 deaths in Edinburgh were equal to an annual rate of 8·4 per 1000, and included a fatal case each of diphtheria and infantile diarrhœa.

Irish Towns.—The 109 deaths in Dublin corresponded to an annual rate of 13·7, or 1·6 per 1000 below that recorded in the previous week, and included 3 from infantile diarrhœa. The 97 deaths in Belfast were equal to an annual rate of 12·2 per 1000, and included 8 from infantile diarrhœa and 1 each from enteric fever and scarlet fever.

VITAL STATISTICS OF LONDON DURING AUGUST, 1920.

IN the accompanying table will be found summarised statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious disease, it appears that the number of persons reported to be suffering from one or other of the ten diseases notified in the table was equal to an annual rate of 6·6 per 1000 of the population, estimated at

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING AUGUST, 1920.

(Specially compiled for THE LANCET.)

CITIES AND BOROUGHS.	Estimated civil population, 1919.	Notified Cases of Infectious Disease.												Deaths from Principal Infectious Diseases.								Deaths from all causes.	Death-rate per 1000 living.
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Poliomyelitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.		
LONDON	4,358,309	—	1321	671	—	22	—	31	151	10	5	2211	6·6	—	6	8	56	15	3	105	193	0·6	3101	9·3
West Districts:																								
Paddington	143,938	—	30	12	—	—	—	—	5	—	—	47	4·3	—	1	—	1	1	—	—	3	0·3	70	6·3
Kensington	157,886	—	51	14	—	1	—	3	4	—	—	73	6·0	—	—	2	2	1	—	5	10	0·8	138	11·4
Hammersmith	130,981	—	42	25	—	—	—	2	1	1	1	72	7·2	—	—	1	3	—	—	1	5	0·5	73	7·3
Fulham	152,543	—	70	27	—	—	—	2	5	1	—	105	9·0	—	—	1	2	—	—	2	5	0·4	93	7·9
Chelsea	60,573	—	4	5	—	—	—	—	1	—	—	10	2·2	—	—	—	1	—	—	—	1	0·2	48	10·3
City of Westminst'r	127,533	—	11	10	—	2	—	2	4	—	—	29	3·0	—	1	—	—	—	—	—	1	0·1	67	6·8
North Districts:																								
St. Marylebone	97,953	—	30	1	—	3	—	—	3	—	—	37	4·9	—	1	—	—	—	—	1	2	0·3	72	9·6
Hampstead	88,012	—	6	8	—	—	—	—	5	—	—	19	2·8	—	—	—	—	—	—	1	1	0·1	43	6·4
St. Pancras	219,434	—	54	44	—	1	—	2	6	—	—	107	6·4	—	—	—	2	1	—	2	5	0·3	177	10·5
Islington	323,034	—	82	78	—	2	—	2	8	3	1	176	7·1	—	1	—	8	—	—	6	15	0·6	220	8·9
Stoke Newington	50,954	—	14	11	—	—	—	1	1	—	—	27	6·9	—	—	—	1	—	—	1	2	0·5	47	12·0
Hackney	216,736	—	50	23	—	2	—	2	5	—	—	82	4·9	—	—	—	2	3	—	6	11	0·7	116	7·0
Central Districts:																								
Holborn	38,156	—	5	6	—	—	—	—	1	—	—	12	4·1	—	—	—	—	—	—	2	2	0·7	37	12·6
Finsbury	75,291	—	25	9	—	—	—	—	1	—	—	35	6·1	—	—	—	—	1	—	3	4	0·7	62	10·7
City of London	13,893	—	—	—	—	—	—	—	1	—	—	1	0·9	—	—	—	—	—	—	—	—	—	15	14·1
East Districts:																								
Shoreditch	98,134	—	35	17	—	—	—	—	3	—	1	56	7·4	—	—	—	1	—	—	8	9	1·2	103	13·7
Bethnal Green	110,085	—	71	41	—	—	—	2	11	1	1	127	15·0	—	—	2	5	—	—	1	8	0·9	66	7·8
Stepney	232,506	—	186	31	—	—	—	4	15	1	—	237	13·3	—	—	—	2	1	—	12	15	0·8	196	10·9
Poplar	153,644	—	102	57	—	2	—	—	6	1	—	168	14·3	—	—	1	4	3	1	6	15	1·3	141	12·0
South Districts:																								
Southwark	179,971	—	59	32	—	—	—	—	15	—	—	106	7·7	—	—	—	2	1	—	6	9	0·7	138	10·0
Bermondsey	124,239	—	74	14	—	1	—	1	4	—	—	94	9·9	—	—	—	2	—	—	4	6	0·6	98	10·3
Lambeth	282,322	—	60	31	—	—	—	—	9	1	1	102	4·7	—	1	—	6	—	—	10	17	0·8	230	10·6
Battersea	159,316	—	35	21	—	—	—	1	5	—	—	62	5·1	—	1	—	—	—	—	6	7	0·6	115	9·4
Wandsworth	333,693	—	60	55	—	3	—	3	4	—	—	125	4·9	—	—	—	4	2	1	6	13	0·5	198	7·7
Camberwell	273,802	—	66	42	—	1	—	—	8	—	—	117	5·6	—	—	—	5	—	1	4	10	0·5	183	8·7
Deptford	111,205	—	26	19	—	—	—	—	7	—	—	52	6·1	—	—	—	—	1	—	3	4	0·5	90	10·5
Greenwich	98,484	—	24	9	—	2	—	—	4	—	—	39	5·2	—	—	—	—	—	—	1	1	0·1	66	8·7
Lewisham	167,754	—	31	15	—	1	—	2	1	—	—	50	3·9	—	—	1	2	—	—	3	6	0·5	116	9·0
Woolwich	136,237	—	18	14	—	1	—	2	8	1	—	44	4·2	—	—	—	1	—	—	5	6	0·6	84	8·0
Port of London	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

4,358,309 persons; in the three preceding months the rates had been 6·3, 6·0, and 6·5 per 1000. Among the metropolitan boroughs the lowest rates from these diseases last month were recorded in Paddington, Chelsea, the City of Westminster, Hampstead, Holborn, the City of London, Lewisham, and Woolwich; and the highest in Fulham, Bethnal Green, Stepney, Poplar, and Bermondsey. The prevalence of scarlet fever was somewhat greater than in the preceding month; this disease was proportionally most prevalent in Fulham, Bethnal Green, Stepney, Poplar, and Bermondsey. The Metropolitan Asylums Hospitals contained 2251 scarlet fever patients at the end of the month, against 1671, 1674, and 1940 at the end of the three preceding months; the weekly admissions averaged 335, against 223, 251, and 284 in the three preceding months. Diphtheria was slightly less prevalent than in the preceding month; the greatest prevalence of this disease was recorded in Hammersmith, St. Pancras, Islington, Stoke Newington, Bethnal Green, and Poplar. The number of diphtheria patients under treatment in the Metropolitan Asylums Hospitals, which had been 1783, 1590, and 1470 at the end of the three preceding months, further fell to 1388 at the end of August; the weekly admissions averaged 173, against 214, 189, and 179 in the three preceding months. The prevalence of enteric fever was about half that in the preceding month; of the 22 cases notified during the four weeks ended August 28th, 3 belonged to St. Marylebone, 3 to Wandsworth, and 2 each to the City of Westminster, Islington, Hackney, Poplar, and Greenwich. There were 17 cases of enteric fever under treatment in the Metropolitan Asylums Hospitals at the end of the month, against 18, 19, and 24 at the end of the three preceding months; the weekly admissions averaged 3, against 3, 3, and 6 in the three preceding months. Erysipelas was proportionally most prevalent in Hampstead, the City of London, Bethnal Green, Stepney, Southwark, and Woolwich. The 31 cases of puerperal fever notified during the month included 4 in Stepney, 3 in Kensington, and 3 in Wandsworth. The 10 cases of cerebro-spinal meningitis included 3 in Islington; while the 5 cases of poliomyelitis belonged respectively to Hammersmith, Islington, Shoreditch, Bethnal Green, and Lambeth.

The mortality statistics in the table relate to the deaths of civilians actually belonging to the several boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the four weeks ended August 28th the deaths of 3101 London residents were registered, equal to an annual rate of 9·3 per 1000; in the three preceding months the rates had been 12·4, 10·3, and 9·6 per 1000. The death-rates ranged from 6·3 in Paddington, 6·4 in Hampstead, 6·8 in the City of Westminster, 7·0 in Hackney, and 7·3 in Hammersmith, to 11·4 in Kensington, 12·0 in Stoke Newington, 12·0 in Poplar, 12·6 in Holborn, 13·7 in Shoreditch, and 14·1 in the City of London. The 3101 deaths from all causes included 193 which were referred to the principal infectious diseases; of these, 6 resulted from measles, 8 from scarlet fever, 56 from diphtheria, 15 from whooping-cough, 3 from enteric fever, and 105 from diarrhœa and enteritis among children under 2 years of age. No death from any of these diseases was recorded last month in the City of London. Among the metropolitan boroughs the lowest death-rates from these diseases were recorded in Paddington, Chelsea, the City of Westminster, St. Marylebone, Hampstead, St. Pancras, and Greenwich; and the highest in Kensington, Shoreditch, Bethnal Green, Stepney, Poplar, and Lambeth. The 6 deaths from measles were 44 below the average number in the corresponding period of the five preceding years. The 8 fatal cases of scarlet fever were 1 more than the average; of these 2 belonged to Kensington and 2 to Bethnal Green. The 56 deaths from diphtheria exceeded the average by 20; the greatest proportional mortality from this disease occurred in Hammersmith, Islington, Stoke Newington, Bethnal Green, Poplar, and Lambeth. The 15 fatal cases of whooping-cough were 14 fewer than the average; of these, 3 belonged to Hackney, 3 to Poplar, and 2 to Wandsworth. Three deaths from enteric fever were registered during the month, against an average of 6. The 105 fatal cases of infantile diarrhœa were 64 below the average; the greatest proportional mortality from this disease occurred in Holborn, Finsbury, Shoreditch, Stepney, Poplar, and Battersea. In conclusion, it may be stated that the aggregate mortality in London during August from these principal infectious diseases was 35 per cent. below the average in the corresponding period of the five preceding years.

Correspondence.

"Audi alteram partem."

DR. MARCEL BLOCH ON COAGULATION.

To the Editor of THE LANCET.

SIR,—In the French Supplement to THE LANCET of August 7th a paper appeared by Dr. Marcel Bloch on the coagulation of the blood, and you have already commented on the surgical interest of his work in your issue of August 21st. Dr. Bloch puts forward his views as to the part played by calcium in the blood in the phenomenon of coagulation, and advocates a method of measuring the coagulability of the blood, which I may for clearness resume very briefly. His method is based upon dilution and inactivation of the calcium in the blood by means of a solution of sodium citrate. To various tubes containing equal quantities of citrated blood increasing amounts of a solution of calcium chloride are added, and the tubes showing commencement and end of coagulation noted. By means of this method pathological variations of coagulability have been determined. As a result of these observations Dr. Bloch has formulated a theory of the coagulation of blood, the prime factor in the process being calcium salts. It is well known that calcium is essential for the clotting of blood, but it appears from Dr. Bloch's paper that too much importance is given to the part played by calcium salts without any real evidence to support this claim.

It may fairly be assumed, in the present state of our knowledge, that some of the calcium is combined with the proteins in the blood, but I can find no evidence to support the view that it is all in this form. Further, there is no real evidence of the way in which sodium citrate prevents coagulation, and certainly less of the actual dose required to prevent coagulation. In an investigation of the calcium metabolism in certain bone diseases it has been frequently observed that the blood coagulates very rapidly, even when three times the usual amount of sodium citrate is added. Again, it is a noteworthy feature that the blood in alcoholism clots very readily; and here, again, sodium citrate is unable to prevent it. This increased coagulability of the blood is naturally beneficial in such cases, but certainly deserves attention when the donor in a blood transfusion has partaken of alcohol previously—a not uncommon occurrence if opportunities are provided. It is in just such cases that sodium citrate probably assists rather than retards coagulation, a fact which may further explain its observed toxicity. That the results produced were in any way due to impurities in the sodium citrate was negatived by the use of absolutely pure sodium citrate.

The same effects have been observed, when potassium oxalate is substituted for sodium citrate. Thus in certain cases coagulation occurs whether the calcium salts have been non-ionised by citrate or precipitated by oxalate. The effects of alcohol on the complement-deviation test are familiar, and in this case we know that the action is a purely physical one, and it is suggested that the same change occurs in the blood of alcoholics, or in persons who have consumed alcohol just previous to the test. The physico-chemical basis of coagulation has much to recommend it since we are dealing with a colloidal solution and associated electrolytes, such as calcium. The activation of the electrolytes is by no means as simple a process as we are led to believe, but it would appear that changes in the reaction of the blood may play a not inconsiderable part. The changes may possibly be of small dimensions, hence the necessity of using the most delicate physico-chemical methods for their detection. This is the present objective.

The very interesting hypothesis put forward by Dr. Bloch may be true, but I for one require further proof before accepting it as the only explanation of this relation of calcium to coagulation. There is still a considerable amount of confusion due to the invention of a number of different names to various constituents taking part in the process of coagulation. It has the merit of simplicity, but all the recorded facts unfortunately do not fit in with such a view. It does not explain why certain blood samples coagulate even in excess of sodium citrate or potassium oxalate. Further, with experience of removal of blood for various analyses, it is well known that if too much citrate or oxalate is present the action of chemical coagulants is retarded and often incomplete. The action of non-ionised or inactivated calcium in such a medium is almost negligible, and leads one to suppose that the sodium citrate has a further action so far unexplained. The coagulation of the blood is of such importance as to warrant close attention, and further evidence along the lines already pursued by Dr. Bloch and others will be looked for eagerly.—I am, Sir, yours faithfully,

Sept. 6th, 1920. R. L. MACKENZIE WALLIS.

SMOKING AND OUTPUT: A SUGGESTION.

To the Editor of THE LANCET.

SIR,—In THE LANCET of July 17th you refer to the practice of permitting smoking in workshops, which seems to be gaining favour with employers. It is now stated that the practicability of permitting smoking in certain Royal dockyards is being considered by the Admiralty. Several manufacturing firms in Lancashire, especially in the Manchester area, have allowed their workmen to smoke during a certain period every day. After an experiment extending over several months the Vickers Metropolitan Co. have found that the permission to smoke for a short period daily under regulated conditions has increased the output, secured a more contented spirit among the men, and in general improved the efficiency of the workshops. Under conditions of strict prohibition it was found that the desire to smoke became so keen and overpowering that loitering in search of an opportunity for a surreptitious smoke was a common practice.

Another symptom of the clamour for official recognition of "smoking time" is the demand of students of the London County Council for permission to smoke at its evening classes. It is recorded that during the Great Plague in 1665 all the Eton boys were obliged to smoke in school every morning. During the war it was found that fatigue parties worked all the better, as did troops in training, when allowed a short time to rest and smoke. The effects on efficiency of a regulated well-timed smoking pause might well receive the attention of the Industrial Fatigue Research Board. If elusive entities of unknown chemical constitution, such as so-called vitamines or nutramines can exercise powerful effects on the human organism, there is much to be said for a thoroughly scientific investigation of the influence on the workers' daily "output" of the products of a drug of which at least some of the chemical constituents are known. A custom and solace, originally barbaric in origin, which has invaded all civilised countries and communities and is now practised by both sexes of humanity at practically all ages, must have some deep and far-reaching physiological and psychological significance.

I am, Sir, yours faithfully,

Manchester, August 30th, 1920. WM. STIRLING.

MIKULICZ'S DISEASE.

To the Editor of THE LANCET.

SIR,—The case of Mikulicz's disease reported by Dr. S. G. Askey in your issue of Sept. 4th reminds me that during the last four or five years I have seen three cases of the disease, all in white people, so that it is perhaps not so uncommon as might be supposed.

One case was that of a Greek lady about 60 years of age, whom I saw, in consultation with Dr. Alice Vance Knox of Highgate, some two or three years ago. There was a moderate painless enlargement of both parotids, and also of the submaxillary glands. Moreover, the parotids seemed at times to manifest some acute or subacute inflammatory

change; and when I saw the patient it was possible to squeeze a drop or two of thick clear mucus into the mouth from the unduly prominent orifice of Stenson's duct. But the symptom which was giving rise to most discomfort was the suppression of saliva. This, which, by the way, is not an invariable feature of the disease, was in her case absolute. Neither at meals nor at any other time was the patient's mouth even moistened with saliva, and the tongue, the lips, and the buccal surfaces of the cheeks were parched. As may readily be imagined, the discomfort resulting from the drying up of the secretion was very great. Salivary stimulants like sweets and acids only induced an aching or drawing sensation in the glands, and the patient had to be continually sipping water. In addition to the dryness of the mouth the conjunctivæ also were dry, for there was a complete absence of tears, so that when she had occasion to weep that act had to be effected without the usual overflow from the eyes.

A second case is one which I saw a few months ago in a middle-aged Scotsman. Fortunately for him the secretions had not dried up, but the parotid glands were both enlarged, and for several years he had been subject in an even more pronounced form than the first patient to periodical attacks of inflammation in the enlarged glands, lasting for about ten days and then gradually subsiding. When I saw him he had just reached the end of one of these exacerbations and muco-pus could be expressed from the duct. X ray examination of the glands and ducts, by Dr. Robert Knox, failed to reveal any calculus. From the gland secretion his own medical man, Dr. G. MacLellan Blair, of St. John's Wood, N.W., has had a vaccine made, and he reports that the patient is very much the better for it. Potass. iodid. is also being given.

The true nature of Mikulicz's disease is at present uncertain. The suggestion has been made that the enlargement of the glands may arise from a variety of causes. But while this may be admitted, nevertheless the participation of the lacrymal glands surely indicates that there must be some specific blood infection responsible for the changes. I am not aware whether the condition of the pancreas has been investigated. The disease is extremely chronic, and except for the objection felt by the patient to the fullness which the swellings impart to the face, and apart from such distressing symptoms as may be induced by the suppression of gland secretion, it does not seem to give rise to any serious phenomena.

I am, Sir, yours faithfully,

London, W., Sept. 4th, 1920. DAN MCKENZIE.

PS.—Since the above was written I have seen what looks like a fourth case of the same disease.

LEPROSY IN THE PHILIPPINES: A CORRECTION.

To the Editor of THE LANCET.

SIR,—In the annotation on Leprosy in India in THE LANCET of May 1st you record the impression given at the February Leper Conference in Calcutta that the segregation of lepers in the Philippine Islands has given as wonderful results as were claimed for Sweden, Germany, Norway, and Iceland. But you will note from the following table of our Philippine Health Service, certified by the acting director, that the annual admissions in our leper colony for the last 14 years and 5 months have fluctuated within relatively narrow limits and afford no sufficient evidence that segregation has solved our problem.

Lepers Admitted and Remaining in Culion Leper Colony, 1906 to 1920.

Year.	Admitted.	Remaining.	Year.	Admitted.	Remaining.
1906 (July–Dec.)	802	546	1914	859	3602
1907	690	780	1915	555	3680
1908	1603	1126	1916	966	4265
1909	1378	1726	1917	613	4485
1910	930	2172	1918	973	4692
1911	889	2511	1919	551	4706
1912	964	2991	1920 (Jan.–May)	225	4736
1913	795	3298			

I would like to invite your attention to a letter which I have recently addressed to Professor Milton J. Rosenau, of Harvard University, in connexion with a statement made in his book on "Preventive Medicine" regarding results of leper segregation in our islands. Rosenau admits that in the collections and segregations of lepers in Hawaii the results have been indifferent, and that there must be considered some factor as yet unrecognised in the control and prevention of leprosy.

The erroneous impression that we are on the high road to a solution of our leper question might, if uncorrected, lead to neglect of further researches along other lines. I am, Sir, yours faithfully,

JOSÉ ALBERT,
Professor of Pediatrics; Member, Council of Hygiene, Philippine Health Service.

Manila, July 20th, 1920.

The letter from Professor Albert to Professor Rosenau contains the following passages:—

> I have taken the liberty to call your attention to what appears to be a misstatement in the last two editions of your valuable and admirable book on "Preventive Medicine." I refer to that part of the Prevention of Leprosy Affecting these Islands (page 329) which reads: "In the Philippines segregation of all discoverable cases reduced new admission by 90 per cent."
>
> I am enclosing a table given out by the Philippine Health Service, which sets forth all the yearly admissions in the Culion Leper Colony for the last 14 years and five months or since the institution of the drastic experiment of compulsory segregation. As may be seen from it, the rate of admission has never been reduced to anyway near 90 cent. at any one time. It is evident that in spite of the fact that many cases are hidden, yet the number of annual admissions has oscillated within relatively narrow limits, without any great noticeable decrease.
>
> If we are to draw at all any conclusion from these figures, it would probably be in some way a conclusion similar to your statement for Hawaii that "segregation has so far had no effect upon the prevalence of the disease, and that there are factors in the control of leprosy not yet understood."

THE FRACTIONAL TEST-MEAL.

To the Editor of THE LANCET.

SIR,—The article by Dr. J. A. Ryle on the fractional test-meal in your issue of Sept. 4th raises afresh the question of the value of test-meals. Concerning the one-hour test-meal Dr. T. R. Brown, physician in charge of the gastro-intestinal clinic of the Johns Hopkins Hospital, wrote in 1916:—

> "It was not many years ago that the absence of hydrochloric acid in the gastric juice was considered, if not diagnostic, at least extremely suggestive, of gastric carcinoma. To realise the error in this point of view, and to show that in the vast majority of cases achylia is associated with benign conditions, one has but to mention its presence in a large series of cases. ....."

The writer then proceeds to enumerate 13 groups in which achylia occurs. Not only is gastric carcinoma but one among many of the causes of this condition, but when this particular disease happens to be responsible for the achylia, the one-hour test-meal is of little value, for when hydrochloric acid is absent, the growth is inoperable.

Accordingly, while great advances were being made in the Rontgen diagnosis of diseases of the alimentary canal, the one-hour test-meal lost ground, because it failed to provide information leading to practical results at all commensurate with the difficulties of popularising among patients the old-fashioned stomach-tube. In institutions it hardly held its own with the X rays as a test of gastric motility. For example, in the Mayo Clinic in 1914 a series of 950 patients were examined both by X rays and the single test-meal and the results checked by subsequent operation. The X rays were found to provide the more sensitive test. It was in these circumstances that the view gained ground that the study of the gastric, pancreatic, and intestinal secretions added little, if anything, to the resources of the clinical worker.

We have therefore to inquire at the outset whether the fractional test-meal supplies something which the older method lacked that may win for it a permanent place in the laboratory. Now no stomach containing bismuth, barium, or a tube of any kind whatever is working under physiological conditions, but with Einhorn's tube this fallacy almost disappears, for the inconvenience to the patient is practically negligible. The fractional test-meal provides, then, a picture of the secretory function of the stomach and duodenum obtained under conditions which fairly approximate to the normal. Quite apart from questions of motility, if these secretory studies furnish data of value either in diagnosis or in treatment the case for this method is established. My estimation of the value of such observations of the secretory function throughout digestion and in the resting period is based upon a study of the

American literature, where since 1914 a great body of evidence has accumulated, and upon my experience of fractional test-meals during the past six months at St. Mary's Hospital.

The position is very fairly stated by Rehfuss and Hawk.[1] No extravagant claims are advanced; the method is a useful, if modest, addition to our means of investigation, and we surely have need of every measure that can in any way contribute to accuracy in diagnosis. Moynihan writes:—

"More mistakes are made in the diagnosis of gastric ulcer than is the case in any other abdominal disorder. If all the methods of examination are strictly brought to bear upon cases commonly referred to as those of gastric ulcer, it will be found that in the majority the diagnosis cannot be upheld."

This, apparently, is also the experience of the Mayo Clinic, for Smithies, in an article printed in June this year, states that only 53 per cent. of patients sent to hospital diagnosed as gastric ulcer turn out to be such.

The time, then, is not perhaps inopportune for advancing a plea that no stone should be left unturned in the quest for greater accuracy in gastro-intestinal diagnosis. The first fine careless rapture of our surgical brethren, inspired by the early and brilliant results of gastro-enterostomy, has passed. A more sober spirit is abroad. Many cases have been successfully relieved, others have now been followed from the time they leave the surgeon's hands, through a period of apparent cure, to the return, and often aggravation, of the old symptoms. There has arisen a feeling that more careful selection of cases for operation, based upon exhaustive investigations, must precede further advances, and that any measures which contribute to our knowledge of either motor or secretory abnormalities, with its implied knowledge of the limits of the normal must tend to avert a repetition of these failures. Dr. Ryle's article is a step towards that end.

Nevertheless, it is as well to continue our search for answers to ultimate questions in gastric and intestinal pathology along other lines. To quote the writer whose views open this letter:—

"An attempt to evolve a gastro-intestinal pathology fundamentally on the basis of secretory variations is to lean on a frail reed. ..... The curve is only one of the many clinical data which does not furnish the answer itself, but which adds its little to the many other aids at our command in reaching a true conception of the underlying disease process."

I am, Sir, yours faithfully,

South Audley-street, W., Sept. 6th, 1920. C. M. WILSON.

THE PROBLEM OF DENTAL DISEASE.

To the Editor of THE LANCET.

SIR,—I read with pleasure your annotation under this heading in THE LANCET of August 21st. In this connexion may be mentioned some clinical observations made by me at the Luxor hospital for natives in Upper Egypt prior to 1914. Neither appendicitis nor gastric ulcer appeared among my cases, and cancer was rare. Though syphilis was widespread, yet I found no cases of aneurysm or of locomotor ataxy. As regards cancer, the absence of post-mortem examinations may vitiate my impressions of cancer incidence, but I never saw any kind of growth in a breast nor any cases of mammary abscess. My friend Dr. G. W. Ellacombe, of Livingstone, Northern Rhodesia, had similar experiences among his native patients.

I suggest that immunity from appendicitis and gastric ulcer depended on the nature of the diet, as a result of which, I claim, the population had good teeth. May the absence of gastro-intestinal cancer be due to this also? I would suggest to the Rockefeller Institute that the study of the diet and diseases of the country Arab as compared with his brother living in Cairo and Alexandria might be of value. Owing to the spread of flour-mills and sweet-shops the diet is rapidly changing, but it is still possible to study the native eating coarse wholemeal unleavened bread, and no sugar beyond the natural solution which he extracts from the fibrous cane and from other fruits.

A short time ago Professor J. G. Adami was reported to have stated that the teeth of the U.S.A. citizen were far better than ours. With the utmost respect, I venture to doubt his statement. It is my belief that the teeth of American citizens are extensively diseased, and the very number and importance of their dental surgeons would seem to support my statement. Now that the U.S.A. have gone "dry," and in consequence still more "sweet," the dental surgeons and doctors will doubtless be busier than ever. The suggestion that 10,000 more dental surgeons are required in this country is also attributed to Professor Adami. I protest at being asked to pay for this expensive host of officials when the advanced disease which they are to scrape out and plug can be almost entirely prevented by common-sense feeding and discipline in the home. Dr. Sim Wallace and others have actually proved that prevention is simple and inexpensive. Dr. James Wheatley, medical officer of health for Shropshire, also has figures pointing to the improvement of the children's teeth under war circumstances which are arresting and which I trust he will publish. For example, cow's milk is an entirely unnatural food for the human child, and its consumption in large quantities may have disastrous results to the children and sick people whose staple diet it has become. Just as alcohol in the form of wine, beer, or spirits does no harm, but in many cases positive good when taken in moderation, so it is with commercial sugar and with milk. There is far too much stress laid to-day upon heat calories and far too little upon the number and kind of meals necessary to exercise the teeth and keep the mouth clean and healthy. Much money and illness and many operations for gastric ulcer and appendicitis could be saved by putting the true facts about dental caries before the women of the country.

I am, Sir, yours faithfully,

W. E. NICKOLLS DUNN, M.B. Lond.

Brighton, August 30th, 1920.

[1] Journal of the American Medical Association, August 14th, 1920.

Medical News.

A JOINT Conference of the Central Association for the Care of the Mentally Defective and the National Special Schools Union will be held at the Church House, Westminster, from Thursday to Saturday, Nov. 25th–27th. The Right Hon. H. A. L. Fisher is expected to address the opening session, at which Mr. Leslie Scott will preside. Sir William Byrne will be in the chair on the second day, and Dr. A. E. Eichholz on Saturday morning. Further information from the honorary secretary of the Central Association, Queen Anne's Chambers, Tothill-street, London, S.W. 1.

UNIVERSITY OF LONDON.—Preliminary arrangements for advanced lectures in physiology for the session 1920–21, details of which will be announced later, show a varied programme of courses to be delivered by distinguished physiologists:—

During the first term at King's College Dr. C. Da Fano will lecture on Histology of the Nervous System on Wednesdays, at 4.30 P.M., beginning on Oct. 13th.

At the University Buildings, South Kensington, Prof. A. D. Waller (in conjunction with Mr. J. C. Waller) will give a course of eight lectures on Experimental Studies in Vegetable Physiology and Vegetable Electricity on Tuesdays, beginning on Oct. 12th.

During the second term Prof. M. S. Pembrey, at Guy's Hospital, will give eight lectures on the Physiology of the Embryo, Fœtus, and Newly Born, on Thursdays, at 4.30, and Mr. J. A. Gardner will give a course on Bio-Chemistry (title and place not yet arranged).

In the third term a course of lectures by various lecturers, to be arranged by Prof. F. A. Bainbridge, at St. Bartholomew's Hospital, and Prof. H. E. Roaf will give eight lectures at the London Hospital on Reception of Sensory Stimuli.

All these courses are recognised as advanced lectures which a candidate for B.Sc. honours may name for part of his examination.

The following scheme of intercollegiate advanced work in physiology has been approved for the Honours B.Sc. Examination, and students of the participating colleges are free to attend all the courses:—

First term: Prof. W. M. Bayliss (University College), Physical Chemistry in Relation to Physiology.

Second term: Prof. W. D. Halliburton and Dr. Rosenheim (King's College), Advanced Chemical Physiology; and Prof. M. S. Pembrey (Guy's Hospital), Practical Work on Respiration.

Third term: Dr. J. S. Edkins (Bedford College), Advanced Practical Histology; and Prof. F. A. Bainbridge (St. Bartholomew's Hospital), course of practical work on Electrical Changes in Skeletal and Cardiac Muscle.

Students requiring further information regarding the lectures should address their inquiries to the heads of the laboratories at which they will be delivered.

MANCHESTER ROYAL INFIRMARY.—**The course of** post-graduate lectures held last year is to be resumed; the first lecture of this session will be held on Tuesday, Oct. 5th. Details of the course will be published in our Medical Diary.

POST-GRADUATE STUDY FOR GENERAL PRACTITIONERS AT ST. ANDREWS.—A short course of post-graduate study for general practitioners will be given at the Clinical Institute, St. Andrews, under the direction of Sir James Mackenzie, commencing on Monday, Oct. 11th. The course, to which only a limited number of members will be admitted, will consist of lecture demonstrations dealing with the symptomatology of disease in its early stages, and will be supplemented by demonstrations on matters of clinical interest in anatomy, physiology, chemistry, bacteriology, ophthalmology, and radiology. The fee for the course is £10 10s. Graduates desirous of attending should communicate with the secretary, the Clinical Institute, St. Andrews, Fifeshire.

Professor J. Bretland Farmer, F.R.S., has been appointed a member of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research.

AT the last meeting of the Dursley (Gloucester-shire) Rural District Council the medical officer of health reported that six cases of enteric fever had been notified in a family at Uley.

THE West Suffolk Hospital at Bury St. Edmunds has decided to charge in-patients 10s. weekly. In addition to £6000 given by the Red Cross Society, £9000 will have to be raised locally for the reconstruction of the hospital.

THE sum of £2000 has been raised for the Bolingbroke Hospital, Wandsworth Common, by the Balham and Tooting Traders' Association.

BEQUEST OF A MEDICAL MAN TO HOSPITALS.—**The** late Mr. Edwin Allan Maling, consulting surgeon to the Sunderland Royal Infirmary, the Sunderland Eye Infirmary, and the Seaham Harbour Infirmary, who died on April 12th, left £500 to the Sunderland Royal Infirmary and £200 to the Sunderland and North Durham Eye Infirmary.

PRESENTATION TO A MEDICAL MAN.—**At Penzance,** on Sept. 1st, Dr. J. B. Page was presented by the local division of the St. John Ambulance Brigade with a silver cigarette box on the occasion of his leaving for New Zealand, as a mark of acknowledgment for his services as honorary instructor.

MEDICAL MAGISTRATES. — **Dr. Sydney Garrett** Vinter has been placed on the commission of the peace for the county of Cornwall. Dr. Arthur Briggs Dunne has been appointed a justice of the peace for the West Riding of Yorkshire. Dr. William Edmund Thomas has been placed on the commission of the peace for the county of Glamorgan.

St. Thomas's Hospital Old Students' dinner will take place at the Connaught Rooms, Great Queen-street, W.C., on Friday, Oct. 1st, at 7 o'clock for 7.30. The chair will be taken by Dr. Frederick Foord Caiger. Tickets, price 17s. 6d., can be obtained from the honorary secretaries at St. Thomas's Hospital.

AT a recent meeting of the Axminster (Devon) Board of Guardians a letter was read from the Poor-law Medical Officers Association advocating the elimination of the appointment of part-time district medical officers and the appointment of whole-time medical officers; it was suggested that the board should have one full-time medical officer. The guardians did not consider it advisable to take any action in the matter.

DEVON V.A. HOSPITALS.—**From 1914 to 1920 the** number of patients admitted to the Devon V.A. Hospitals was 58,200. Of these, 45,475 were treated in V.A. hospitals and 12,725 in civil and private hospitals, as compared with 38,181 in Gloucestershire, 22,103 in Somerset, 21,100 in Dorset, and 6403 in Cornwall.

THE LATE DR. L. SHINGLETON-SMITH.—**The death** occurred recently of Lionel Shingleton-Smith, of Brecon, in his forty-fourth year, from injuries caused by a motor-car collision. The deceased was the second son of Dr. R. Shingleton-Smith, of Clifton, Bristol, was educated at Bristol and Cambridge, and qualified M.R.C.S., L.R.C.P. in 1905, and M.B., B.Ch. in 1908. After holding the posts of junior house surgeon and casualty officer at the Bristol Royal Infirmary, and house surgeon at the South Devon Hospital, he set up in practice in Brecon, where he was very popular. He held several union and other appointments, and was honorary physician to the Brecknock County and Borough Infirmary.

EXETER DISPENSARY.—**At a special meeting of** the governors of the Exeter Dispensary held on August 26th it was decided, owing to the increasing deficit on the working of the charity, to make a charge to patients for such things as medicines and dressings.

ROYAL DEVON AND EXETER HOSPITAL.—**A special** meeting of the governors of this institution was held on August 26th, when it was decided to alter the rules so as to provide for a charge being made for in- and out-patients. It was also determined to alter the recent decision of the governors, and to use the second storey of the "Victory Wing" for the accommodation of nurses instead of for a children's ward. The children will be provided for by erecting a corridor or bungalow wing in the garden of the hospital. The adoption of this plan, towards which an anonymous donor has already given £500, will result in a saving of £5000.—Dr. J. Delpratt Harris has been appointed honorary consulting medical officer to this hospital. Dr. Harris has been connected with the institution since 1881, when he inaugurated the electrical department, which has now been brought up to modern requirements.

THE LATE DR. R. P. MITCHELL.—Dr. R. P. Mitchell, who died recently in East Africa, had the distinction of serving with the South African Medical Corps on military service in East Africa for three years. Most of his professional career was spent in the Transvaal. He lived at Barberton from 1886 to 1894, when he went to the Rand, returning to Barberton 16 years later. Dr. Mitchell took a prominent part in the Jameson raid, and suffered imprisonment as a member of the famous Reform Committee.

BLIND PERSONS ACT.—**This Act, which entitles** blind persons to obtain, at the age of 50, a pension to which they would normally be eligible at the age of 70, comes into operation to-day. The Act is intended to apply to those who are so blind as to be unable to perform any work for which eyesight is essential. They must be natural-born British subjects who have resided in the United Kingdom since reaching the age of 30 for an aggregate period of not less than 12 years, and whose circumstances would render them eligible for old-age pensions if they were now 70 instead of 50 years of age. In the event of an appeal against the decision of the local pension committees as to whether a claimant fulfils the statutory condition of blindness, the Ministry may refer the case to a medical man for investigation.

THE LATE DR. G. BOWMAN.—**In the death of Dr.** George Bowman, whose funeral took place in Manchester on August 31st, the local community have sustained a distinct loss, even though he had given up active practice for some years on account of failing health. Born in 1848, George Bowman was the son of a practitioner of high repute in Old Trafford. He was educated at the School of Medicine in Manchester and at Edinburgh University, where he graduated M.D. in 1873, having qualified M.R.C.S. the previous year. He succeeded his father in practice, and was one of the quiet unobtrusive practitioners who are often, as in this case, among the most popular and successful in their districts. Dr. Bowman leaves a widow and two children.

The Services.

ROYAL NAVAL MEDICAL SERVICE: PAY OF RECRUITING OFFICERS.

BY a revision of the salaries of officers engaged in recruiting for the Navy, notified in Admiralty Orders, medical officers engaged in the recruiting service receive £200 per annum, except the officer at Belfast, who will be paid £150 per annum.

TEMPORARY COMMISSIONS IN THE ROYAL ARMY MEDICAL CORPS.

In extension of the notice published in our columns on August 14th, the War Office is granting temporary commissions in the R.A.M.C. for a period of six months, for home service, to a limited number of medical men not over 55 years of age. Remuneration will be at the rate of £600 per annum for those who have not previously held commissions, and £650 for those who have served during the late war for a period of 12 months. In addition they will receive free rations or an allowance in lieu when rations are not issued in kind, and the regulated allowances and expenses when travelling on duty. An outfit allowance of £30 will be made to those to whom it has not been previously issued. Applications should be made at once in writing, to the Secretary of the War Office (A.M.D.1), London, S.W.1, and should contain a statement of the candidate's age and previous service, if any.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Cmdr. J. C. F. D. Vaughan is placed on the Retired List.

ROYAL ARMY MEDICAL CORPS.

Temp. Major N. G. Cooper to relinquish the acting rank of Lieutenant-Colonel.

Major C. R. M. Morris to be acting Lieutenant-Colonel.

Capt. W. Foot relinquishes the acting rank of Major.

The undermentioned temporary Captains relinquish their commissions and retain the rank of Captain:—W. H. Harvey, W. E. Fraser, A. S. Cook, J. M. Wallace, H. Harrison, A. R. Berrie.

Temp. Capt. C. W. Joynt relinquishes his commission.

Capt. J. McP. Mackinnon is seconded for service with the Egyptian Army.

The undermentioned Lieutenants (temporary Captains) to be Captains:—G. E. L. Simons, E. Parker, L. G. Blackmore, V. J. Bonavia, D. J. Batterham.

SPECIAL RESERVE OF OFFICERS.

The undermentioned Captains relinquish their commissions on account of ill-health contracted on active service:—C. A. McGuire (granted the rank of Major) and G. E. Shand (retains the rank of Captain).

TERRITORIAL FORCE.

Lieut.-Col. A. T. Falwasser resigns his commission and retains the rank of Lieutenant-Colonel.

Major H. G. Smeeth (late Major, R.A.M.C., Spec. Res.), to be Lieutenant-Colonel and to command 1st East Lancs Field Ambulance.

Capt. C. H. Vernon (late Royal Air Force Medical Service) to be Captain.

Major (acting Lieutenant-Colonel) W. F. Roe relinquishes the acting rank of Lieutenant-Colonel on ceasing to be specially employed.

Capt. (acting Major) L. Beesley relinquishes the acting rank of Major on ceasing to be specially employed.

Capts. W. W. Adamson and L. A. Williams resign their commissions and retain the rank of Captain.

Officers resigning their commissions and granted the rank of Major: Capts. A. Anderson, C. S. P. Black, W. A. Brechin.

Capt. R. B. Lilly (late temporary Captain R.A.M.C.) to be Captain.

1st London General Hospital: Major L. B. Rawling is restored to the establishment.

3rd Northern General Hospital: Capt. G. S. Simpson is restored to the establishment on ceasing to hold a temporary commission in the R.A.M.C.

TERRITORIAL FORCE RESERVE.

Capt. C. T. Matthews resigns his commission and retains the rank of Captain.

ROYAL AIR FORCE.

Medical Branch.—The undermentioned are transferred to unemployed list: Capt. (acting Lieut.-Col.) A. P. Bowdler, Capts. R. D. Jones and E. H. L. Le Clezio, and Lieut. R. I. Rhys.

Flying Officer G. H. H. Maxwell to be Flight Lieutenant.

INDIA AND THE INDIAN MEDICAL SERVICE.

Appointments.—Major L. Dunbar, R.A.M.C., to hold civil medical charge of Benares, vice Col. Walker, on leave. Capt. J. N. Turner, Agency Surgeon, Sibi. Capt. P. R. Vakin to hold civil medical charge of Roorkee, vice Capt. J. S. S. Martin. Capt. D. K. Sabhesan to hold civil medical charge of Roorkee, vice Capt. P. R. Vakin. Major P. C. Bedell, on return from military duty, to the charge of the Railway Dispensary, Moradabad. Capt. A. S. Fry, Medical Officer of Seistan Consulate. Major T. J. Carey Evans, Residency Surgeon, Mysore. Major H. H. Thorburn, Residency Surgeon, Baluchistan. Lieut. A. Innes Cox, to hold civil medical charge of the Allahabad District, vice Capt. L. A. P. Anderson. Major A. N. Dickson, to Peshawar. Major A. H. Proctor, First Resident Surgeon, Presidency Hospital, Calcutta.

Resignations.—Capt. P. S. Connellan has resigned his commission. Lieut.-Col. G. A. W. Hall retires from the Service. Major Norman White, Sanitary Commissioner to Government of India, retires, and has received an appointment with Ministry of Health, London. Lieut.-Col. Ashton Street, Principal of Grant Medical College, retires after 30 years' service.

Leave granted.—Lieut.-Col. H. J. Hugo, six months' leave. Lieut.-Col. J. W. Watson, eight months' leave. Major D. P. Goil, Civil Surgeon, Rajshahi, privileged leave for two months. Major W. D. Neal, Assistant to Superintendent, Medical College Hospital, Calcutta, six months' leave. Major V. B. G. Green-Armytage, Resident Surgeon, Presidency General Hospital, Calcutta, six months' leave. Major D. Heron, Medical Officer, Seistan Consulate, eight months' leave. Lieut.-Col. W. Young, Civil Surgeon, Lucknow, six months' leave. Lieut.-Col. L. G. Fischer, combined privilege leave and furlough. Major N. H. Scott, Civil Surgeon, Peshawar, combined leave. Major C. McDonald, Civil Surgeon, Sibsagar, four months' combined leave. Major S. Chuckerbutty, Civil Surgeon, extended leave for five months. Lieut.-Col. J. W. D. Megaw, Principal Medical College, Lucknow, six months' leave.

PAY OF ARMY NURSES.

An Army Order just issued announces the new rates of pay and retired pay of the Q.A.I.M.N.S. and of the permanent nursing establishment of the military families' hospitals, with effect from April 1st, 1920. Briefly the new annual rates of pay are as follows: Matron, £115, rising by £10 yearly to £185; assistant matron, £85, rising by £5 a year to £95; sister, £75, rising by £5 to £85; and staff or charge nurse, £60, rising by £2 10s. to £65. In addition, charge pay for matrons of Q.A.I.M.N.S. will be at rates not exceeding £45 a year, and for matrons of military families' hospitals £20 or £30 a year. Retired pay (with effect from April 1st, 1919) will comprise a service element (£3 for each year of service) and a rank element; but a nurse retiring with less than 10 years' service will not be eligible for retired pay. The maximum rates of these two elements together are as follows: Matron, £170; sister, £75; staff nurse or charge nurse, £55.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN, Hunter-street, Brunswick-square, W.C.

Post-Graduate Course on Venereal Diseases for Medical Women. A Course arranged by the London (Royal Free Hospital) School of Medicine for Women, the Royal Free Hospital, the Elizabeth Garrett Anderson Hospital and the London Lock Hospital, for the instruction of qualified medical women in the Treatment of Venereal Diseases. The Course will extend over two weeks.

MONDAY, Sept. 13th.—12 noon, Lecture:—Mr. O. T. Dinnick: Modern Treatment of Venereal Disease (at the London (Royal Free Hospital) School of Medicine for Women). 5 P.M., Mrs. Rorke, M.B.: Out-patient Cliniques for Women and Children (at the Royal Free Hospital, Gray's Inn-road).

TUESDAY.—9.30 A.M., Injections (at the London Lock Hospital, 283, Harrow-road, W.) 2 P.M., Mr. C. Gibbs: Lecture and Visit to Wards (at the London Lock Hospital, Harrow-road). 6.30 P.M., Dr. Ruth Balmer: Out-patient Cliniques for Women and Children (at the Elizabeth Garrett Anderson Hospital, 144, Euston-road, N.W.)

WEDNESDAY.—9 A.M., Dr. Morna Rawlins: Visit to Maternity Wards and Labour Department (at the London Lock Hospital, Harrow-road). 11 A.M., Dr. Mary Schofield: Pathological Demonstrations (at the Royal Free Hospital). 3.30 P.M., Mr. J. E. Lane: Lecture and Visit to Wards (at the London Lock Hospital, Harrow-road).

THURSDAY.—2 P.M., Mr. J. E. R. MacDonagh: Lecture and Visit to Wards (at the London Lock Hospital, Harrow-road). 5 P.M., Injections (at the Royal Free Hospital).

FRIDAY.—10 A.M., Mrs. Rorke, M.B.: Treatment Ante-natal Cases (at the Royal Free Hospital). 5 P.M., Mr. J. J. Abraham: Injections and Out-patient Clinique for Women and Children (at the London Lock Hospital, 91, Dean-street, W.). 6.30 P.M., Dr. Ruth Balmer: Out-patient Cliniques for Women and Children (at the Elizabeth Garrett Anderson Hospital).

SATURDAY.—9.15 A.M., Injections (at the Elizabeth Garrett Anderson Hospital).

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Sept. 13th.—2 P.M., Mr. B. Harman: Eye Department. 2.30 P.M., Dr. A. Saunders: Visit to Medical Wards.

TUESDAY.—2 P.M., Mr. Banks Davis: Diseases of the Throat, Nose, and Ear. 2 P.M., Dr. Pernet: Skin Department.

WEDNESDAY.—10 A.M., Dr. A. Saunders: Medical Diseases of Children. 2 P.M., Mr. D. Armour: Visit to Surgical Wards.

THURSDAY.—2 P.M., Dr. G. Stewart: Medical Out-patients. 2 P.M., Mr. B. Harman: Eye Department.

FRIDAY.—2 P.M., Dr. Burnford: Medical Out-patients. 2.30 P.M., Mr. Addison: Visit to Surgical Wards.

SATURDAY.—2 P.M., Dr. Owen: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients.

Daily:—10 A.M., Ward Visits. 2 P.M., In-patient, Out-patient Clinics and Operations.

MALE LOCK HOSPITAL, Dean-street, W.

MONDAY, Sept. 13th, WEDNESDAY, AND FRIDAY.—5 P.M., Dr. C. Russ: Demonstration of the Treatment of Gonorrhœa by Electrolysis.

Communications, Letters, &c., to the Editor have been received from—

A.—Dr. A. Abrahams, Lond.; Capt. V. R. S. Ayyer, I.M.S., Karachi; Prof. J. Albert, Manila.

B.—Prof. J. Barcroft, Cambridge; Dr. G. A. Brown, Glasgow; Dr. U. N. Brahmachari, Calcutta; Board of Scientific Societies, Lond.; Board of Control, Lond., Sec. of.

C.—Dr. W. Cramer, Lond.; Dr. H. P. Cholmeley, Forest Row; Central Association for the Care of the Mentally Defective, Lond.; Children's Country Holidays Fund, Lond.

D.—Dr. V. Dickinson, Lond.

E.—Mr. F. G. East, New Malden.

F.—Prof. J. E. S. Frazer, Lond.

G.—Lt.-Col. E. Goodall, Lond.; Capt. J. K. Gaunt, R.A.M.C.; Dr. W. H. Gregory, Beverley; Dr. L. H. Guest, Lond.

H.—Messrs. Handley Page, Ltd., Lond., Prof. F. Hobday, Lond.; Mr. J. T. Henderson, Pietermaritzburg.

I.—India Office, Lond.

J.—Jamaica, Registrar-General of, Spanish Town.

K.—Dr. W. N. W. Kennedy, Croydon; Miss M. Knightley, Lond.

L.—Dr. E. B. Leech, Manchester; Dr. R. B. Low, Lond.; Dr. C. Lillingston, Gorleston; Dr. T. L. Llewellyn, Newcastle; Dr. J. R. Lord, Dalkey; Liverpool, Medical Officer of Health of.

M.—Dr. D. McKenzie, Lond.; Dr. J. J. R. Macleod, Paisley; Medical & Research Council, Lond.; Dr. R. S. Miller, Lond.; Dr. A. A. Mumford, Manchester; Dr. W. C. Mackenzie, Lond.; Dr. G. N. Meachen, Westcliffe-on-Sea; Ministry of Health, Lond.; Metropolitan Asylums Board, Lond.; Ministry of Agriculture and Fisheries, Lond.; Ministry of Pensions, Lond.

N.—National Anæsthesia Research Society, Columbus, Ohio.

O.—Dr. T. Orr, Lond.

P.—Messrs. G. P. Putnam's Sons, Lond.

Q.—Queen's Hospital for Children, Lond., Sec. of.

R.—Dr. E. T. Roberts, Glasgow; Mr. A. M. Rovin, Detroit.

S.—Prof. W. Stirling, Manchester; Stretford, Medical Officer of Health of; Dr. R. E. Smith, Barry; St. Thomas's Hospital, Lond.; Society of Medical Officers of Health, Lond.; Dr. G. A. Stephens, Swansea; Mr. T. Sington, Manchester; Scientific and Industrial Research Dept., Lond.; Sir E. F. Schafer, Cassis; Save the Children Fund, Lond.

T.—Dr. A. H. Thompson, Liskeard.

W.—Dr. A. Wood, Rugby; Dr. W. J. H. Wood, Southampton; Sir C. Wallace, Lond.; Capt. J. T. A. Walker, R.A.M.C.(T.F.); Dr. R. L. M. Wallis, Lond.; West London Hospital Post-Graduate College; Dr. K. M. Walker, Lond.; Dr. F. G. Wallace, Lond.; Dr. C. M. Wilson, Lond.; Dr. J. P. Walker, Ryde,

Appointments.

ALDOUS, G. F., F.R.C.S. Edin., has been appointed Consulting Surgeon to the Totnes Hospital, South Devon.

BURNELL, A. C., M.B., Honorary Assistant Surgeon to the Royal Cornwall Infirmary, Truro.

CRAIG, T. (Dudley), Medical Officer of Health to Weetslade Urban District Council.

GRANT, W., M.B., Ch.B. Edin., B.Hy., D.P.H. Durh., Medical Officer of Health to Easington Rural District Council.

GREGORY, W. H., M.D. Edin., Medical Officer to Poor-law Institution, Children's Home, Beverley and Tickton; also to Beverley Postal District.

STEVENS, B. C., M.D., M.S. Durh., F.R.C.S. Edin., L.R.C.P. Lond., D.P.H. Oxon., Assistant Medical Officer of Health and Chief Tuberculosis Officer, County Borough of Portsmouth.

THOMAS, R. E., M.D. Lond., B.S., M.R.C.S., L.R.C.P. Lond., D.P.H. Bristol, Assistant Medical Officer of Health, County Borough of Bath.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Jun. M.O. £500.

Aberdeen University.—Lectureship in Bacteriology.

Abergavenny, Monmouthshire Asylum.—Jun. Asst. M.O. £300.

Ayr County Hospital.—Res. H.S. £120.

Ayrshire Sanatorium, Glenafton, New Cumnock.—Res. Asst. £250.

Barnsley, Beckett Hospital and Dispensary.—Sen. H.S. £250.

Battersea General Hospital (incorporated), Battersea Park, S.W.—Third Res. M.O. £200.

Bedford County Hospital.—Asst. H.S. £150.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—Asst. P. 50 gs. Also Female H.S. £100.

Bethnal Green Infirmary, Cambridge-road, Bethnal Green, E.—Asst. Med. Supt. £500.

Birmingham General Hospital.—Surg. Registrar. £200.

Bootle County Borough.—Tuberc. O. and Dep. M.O.H. £750.

Bradford Royal Infirmary.—H.S. £200.

Brighton Education Committee.—Female Asst. School Doctor. £500.

Brighton, Royal Sussex County Hospital.—Jun. H.S. £150.

British Guiana.—Asst. M.O.H. £600.

Cancer Hospital, Fulham-road, S.W.—Two H.S.'s. £150.

Central London Ophthalmic Hospital, Judd-street, St. Pancras.—H.S. £100.

Chester County Asylum.—Third Asst. M.O. £350.

Children's Infirmary, Cleveland-street, W.C.—Female Asst. M.O. £478.

City of London Hospital for Diseases of the Chest, Victoria Park, E.—H.P. £100.

Colchester, Essex County Hospital.—H.S. £200.

Colonial Service.—M.O.'s for West African Medical Staff, Government Service in Malaya, East African Protectorates, West Indies (including British Guiana), Fiji, and the Western Pacific, &c.

Derby Borough Mental Hospital.—Asst. M.O. £350.

Derby, Derbyshire Royal Infirmary.—Asst. H.S. and Cas. O. £200.

Devon and Cornwall Sanatorium, Didworthy, South Brent.—Locum Tenens. £6 6s. per week.

East Africa.—M.O. to C.M.S., Kavirondo.

Eastbourne, Princess Alice Hospital.—Res. M.O. £175.

Glamorgan County Asylum, Bridgend.—Jun. Asst. M.O. £350.

Govan District Asylum, Cardonald, Glasgow.—Jun. Asst. P. £325.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Asst. Anæsth. £25. Also Asst. Res. M.O. £150.

Huddersfield Royal Infirmary.—Asst. H.S. £150.

Hull City Asylum, Willerby, near Hull.—Jun. Asst. M.O. £300.

Hull Royal Infirmary.—Asst. H.S. £150.

Ingham Infirmary and South Shields and Westoe Dispensary.—Jun. H.S. £175.

Lancaster County Asylum.—Asst. M.O. £300.

Lincoln County Hospital.—Jun. H.S. £150.

Liverpool, Brownlow Hill Poor Law Hospital.—Res. Asst. M.O. £300.

London Lock Hospital, Soho, W.—Hon. S.

Macclesfield General Infirmary.—Res. H.S. £200.

Maidstone, Kent County Mental Hospital.—Jun. Asst. M.O. £300.

Maidstone, West Kent General Hospital.—Two H.S.'s. £220.

Manchester, Ancoats Hospital.—Res. Surg. O. £250.

Manchester Royal Infirmary, Barnes Convalescent Hospital, Cheadle.—Res. M.O. £300.

Manchester Royal Infirmary, Central Branch, Roby-street.—Res. M.O. £250.

Margate, Princess Mary's Hospital for Children, Cliftonville.—Jun. Asst. M.O. £515 6s.

Metropolitan Asylums Board.—Jun. Asst. M.O.'s. £515 6s.

Metropolitan Hospital, Kingsland-road, E.—Cas. O. and Res. Anæsth. £120. Also Asst. H.S. and Asst. H.P. £100 each.

Middlesex County Council, Harefield Sanatorium.—Res. Med. Supt. £700.

National Hospital for Diseases of the Heart, Westmoreland-street, W.—Out-patient M.O. £150.

National Hospital for the Paralysed and Epileptic, Queen-square, Bloomsbury, W.C.—Registrar. £200. Also Sen. H.P. £150.

Newcastle-upon-Tyne City Mental Hospital, Gosforth.—Sen. Asst. M.O. £500.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. Asst. S.

Northampton General Hospital.—H.S. £200.

Nottingham City Education Committee.—Jun. Asst. Sch. M.O. £500.

Oldham Royal Infirmary.—H.S. £250.

Plaistow Fever Hospital.—Second Asst. M.O. £200.

Plymouth, South Devon and East Cornwall Hospital.—H.S. £200.

Preston and County of Lancaster Royal Infirmary.—H.S. and H.P. £180 each.

Prince of Wales's General Hospital, Tottenham, N.—H.P. and H.S. £200. Jun. H.S. and Jun. H.P. £120.

Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—H.S. £100.

Reading, Royal Berkshire Hospital.—H.P. and Second H.S. £200 each.

Royal Chest Hospital, City-road, E.C.—Asst. M.O. £450.

Royal Free Hospital, Gray's Inn-road, W.C.—Female Obstet. H.S. £50.

St. Mary's Hospital, Paddington, W.—Med. Supt. £350.

Salford Royal Hospital.—Res. Surg. O. £250. H.P., H.S., Jun. H.S., and Cas. H.S. £150 each.

Scarborough Hospital and Dispensary.—Two H.S.'s. £150.

Scottish Board of Health.—Dist. M.O.'s. £1000.

Sheffield Royal Hospital.—Asst. Cas. O. £150.

Sheffield Royal Infirmary.—H.P. and H.S. for Ear, Nose and Throat. £150 each.

Sheffield University, Department of Pathology and Bacteriology.—Director. £800. Asst. Director. £500. Curator of Path. Museum. £600.

Southampton County Borough.—Asst. M.O.H. £500.

South London Hospital for Women, South Side, Clapham Common, S.W.—Female Asst. S. Also Clin. Assts.

Surrey County Council, Urban District Council of Barnes.—M.O.H., &c. £800.

Sydney University, New South Wales, Australia.—Chair of Dentistry. £1100. Also Chair of Physiology. £1150.

Talgarth, Breconshire, South Wales Sanatorium.—Jun. Asst. Res. M.O. £400.

Uganda.—M.O. to C.M.S. Mengo Medical School.

Union Mental Hospital Service, South Africa.—Jun. Asst. P.'s. £400.

Ventnor, Isle of Wight, Royal National Hospital for Consumption and Diseases of the Chest.—Asst. Res. M.O. £300. Also Locum Tenens. 7 gs. per week.

Westminster Hospital, opposite Westminster Abbey.—Asst. H.S.

Westmorland Sanatorium and Home, Meathop, Grange-over-Sands.—Res. Asst. M.O. to the Westmorland Sanatorium and Asst. Tuberc. O. for Westmorland. £350.

Worcester County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.

Births, Marriages, and Deaths.

BIRTHS.

ADAMS.—On August 28th, at Prospect House, Clitheroe, the wife of Dr. F. S. Adams, of a son.

AVELING.—On Sept. 2nd, at Chalk Hill, Bushey, the wife of Kenneth Aveling, M.B., of a son.

BLOMFIELD.—On August 31st, at Cornwall-terrace, Regent's Park, the wife of Dr. J. Blomfield, O.B.E., of a son.

CONNAN.—On Sept. 1st, of 17D, Avonmore-road, W. Kensington, to Dorothy (Mackintosh), wife of Donald Murray Connan, M.B., B.S.—a daughter.

HEALD.—On Sept. 2nd, at Kimpton, near Welwyn, the wife of Lieutenant-Colonel C. B. Heald, C.B.E., M.D., of a daughter.

LITHGOW.—On August 30th, at The Close, Tetbury, the wife of Major E. G. R. Lithgow, R.A.M.C., M.R.C.S., L.R.C.P. Lond., of a son (Michael John).

MCCREERY.—On Sept. 2nd, at Huntly, Parkstone, Dorset, the wife of Major A. T. J. McCreery, M.C., M.B., B.Ch., B.A.O. Dub., R.A.M.C., of a daughter.

PAYNE.—On Sept. 4th, at Waungron-road, Llandaff, Cardiff, the wife of Dr. J. Rowland Payne, of a daughter.

MARRIAGES.

DEWAR—D'ALMAINE.—On Sept. 7th, at St. Nicholas Church, Abingdon-on-Thames, by the Rev. H. A. Kennedy, M.A., vicar, assisted by the Rev. R. C. MacKeown, M.A., Robert Scott Dewar, M.A., M.B., Ch.B., Glasgow, to Roubaix, elder daughter of Mr. H. G. W. d'Almaine, The Square, Abingdon.

HANCOCK—BRANWELL.—On Sept. 2nd, at Christ Church, Lancaster-gate, W., by the Rev. Geoffrey Browne, M.C., Allen Coulter Hancock, M.C. (with two bars), M.R.C.S. Eng., L.R.C.P. Lond., Major (late R.A.M.C.), to Vera Primrose Branwell, elder daughter of Mr. and Mrs. Alfred Branwell, Penzance, Cornwall.

REES—HUGHES.—On Sept. 2nd, at the Parish Church, Maidstone, by the Rev. Charles E. Hughes, vicar of Woodhouse, Sheffield, assisted by the Rev. Canon Hardcastle, vicar of the parish, William Arthur Rees, M.D., F.R.C.S., son of the late F. W. J. Rees, I.C.S., and Mrs. Rees, of Swanage, Dorset, to Olive Carey, second daughter of the late Henry A. Hughes, and Mrs. Hughes, of Maidstone, Kent.

SUTTON—GIBBS.—On August 28th, at St. Mary's, Bryanston-square, by the Rev. S. N. L. Ford, M.A., Captain W. H. Sutton, R.A.M.C., L.R.C.P., L.R.C.S. Ed., attached Egyptian Army, to Madeleine Ella, younger daughter of Mrs. W. H. Gibbs, Pinner-road, Harrow.

DEATHS.

ALBAN.—On Sept. 3rd, in London, after an operation, Evan Alban, M.D. St. And., M.R.C.S. Eng., L.S.A., of Aberayron, Cardiganshire, and formerly of Lindfield, Sussex, aged 72 years.

EDWARDS.—On August 27th, at Tor-na-Dee, Aberdeen, Cyril Henry Edwards, M.B., B.S. Lond., M.R.C.S. Eng., L.R.C.P. Lond., L.D.S. R.C.S. Eng.

HARRIS.—On Sept. 1st, at Eastbourne, Frederick Rutherfoord Harris, J.P., of Llangibby Castle, Monmouthshire.

NOTT.—On August 26th, suddenly, from heart failure, while on a visit to the Engadine, Arthur Holbrook Nott, Lieutenant-Colonel, Indian Medical Service (retired), of 22, Drayton Court, London, S.W., second son of the late William Nott, of Devizes, aged 58.

PASLEY.—On August 26th, at Port Harcourt, Nigeria, Claud John Burgoyne Pasley, M.R.C.S. Eng., L.R.C.P. Lond., Colonial Medical Service, Captain, R.A.M.C.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

HEALTH TEACHING IN THE UNITED STATES: PROFESSOR SEDGWICK'S LECTURES AT CAMBRIDGE.

BY SIR G. SIMS WOODHEAD, K.B.E., V.D., M.D., LL.D.,
PROFESSOR OF PATHOLOGY, UNIVERSITY OF CAMBRIDGE.

DURING the early part of the present Long Vacation Course the Cambridge medical students and others interested in the advancement of sanitary science and public health were privileged to hear something of the methods of sanitation employed, and of the health work now being carried on in the United States of America. After a recent visit to the United States a former vice-chancellor, Sir Arthur Shipley, arranged for Professor W. T. Sedgwick, of Boston, professor of biology and public health at the Massachusetts Institute of Technology, to visit Cambridge, attend lectures, and deliver a short course on the organisation of the United States Public Health and other sanitary services, and on the means adopted for education and training in these matters not only of public health officers and sanitary engineers but of the general public.

University and Technological Education in the United States.

In five lectures on this subject Professor Sedgwick set out clearly and concisely the important bearing of study and research on the organisation of public health services in America. Pointing out that England was the cradle of public health and sanitation, Professor Sedgwick stated that our local public health authorities had, in the first instance, assumed responsibilities that the State had failed—or had been unwilling—to shoulder, and that in America the development of sanitation had followed on much the same lines. In Germany, instead of beginning at the periphery of the system, they had attempted from a bureaucratic central organisation to build up and control a comprehensive public service and to lay down by line and rule the duties both of doctors and of the people. The central authority assumed powers and responsibilities that in Anglo-Saxon communities had early been acquired by local bodies. Only later had centralisation been adopted in the United States in order that general interests might be protected and common action taken in large areas, as, for example, in the matter of the protection of a river running through several States.

Dealing with impure water-supplies and their rôle in the production of typhoid and cholera, Professor Sedgwick emphasised the fact that organisms other than those producing cholera and typhoid sometimes accounted for more deaths than do water-borne typhoid germs, and referred to Mr. Allen Hazen's observation that for every death from typhoid resulting from infection through water two or three deaths occur from diseases such as paratyphoid, diarrhœa, and enteritis. Many cases of acute diarrhœa recover, others succumbing with alarming rapidity. In the United States the skilled layman appears to have played a much more important part in the advancement of preventive medicine and sanitation than he has been encouraged to play in this country. Sanitary engineering and public health problems are handled not only by laymen specially trained as health officers, but by medical men whose interest in what may be termed "bedside medicine" is comparatively slight. There has thus grown up a corps of sanitary officers of great value. One advantage of this system is that the clinician, whilst benefiting by the experience of the sanitary officer and utilising it to the full in his everyday work, need have no fear that the sanitary officer, who claims to be trained only in the preliminary science branches of medicine will feel called upon or competent to interfere in the diagnosis and treatment of the medical practitioner's private patients.

Laymen as Sanitary Officers.

The Massachusetts Institute of Technology, combining forces with the Medical School and the University of Harvard, was the first school in America to make any systematic attempt to train health officers, sanitary inspectors, and engineers. It was "an assembled school" in which a lecture on chemistry here, a lecture on physiology there, with a few special lectures added or thrown in, was deemed sufficient to serve the purpose. Later a more prolonged and complete course was provided. This was attended by medical men, of course, but also by graduates in science and engineering, who soon constituted a useful body of health officers for American towns. From this source have also been supplied sanitary workers in China, Fiji, and elsewhere, members of a skeleton sanitary corps in the U.S. army and skilled men ready to undertake, under the American Red Cross, crusades against tuberculosis and other infective and parasitic diseases, not only at home but abroad, wherever the interests of America are involved or its sympathies aroused. Now, however, the good work has spread to the Johns Hopkins University, which up to 1918 had no adequate school of public health, but has since built up the most advanced and complete Public Health School in the United States. In 1914 the Rockefeller Foundation, realising the lack of trained personnel, and the fact that men who had passed through the ordinary medical curriculum were mostly neither qualified to deal with, or really interested in, public health, made arrangements to found at the Johns Hopkins University in Baltimore a well-equipped and fully endowed School of Hygiene, Preventive Medicine, and Sanitary Science which, though working with the medical department, should be separate from it. For the teaching at the Harvard Medical School and the Massachusetts Institute of Technology there was no endowment—nothing but the goodwill of certain professors and the students' fees—£50 a year from each of the few students. Now all this is being altered, and at Baltimore special departments are being planned, each to be placed under some distinguished teacher or organiser. Professor W. H. Welch, the well-known pathologist of the Johns Hopkins Medical School, has resigned that position to take up the duties of principal and director of this new school, and Dr. William H. Howell, professor of physiology and formerly dean of the Medical School, has accepted the post of assistant director. These appointments, were there nothing else, indicate the estimate formed by the highest educational circles of the new public health school. Up to June last only one student had graduated in public health from the Johns Hopkins School, but in Boston, with its enthusiastic personnel though smaller resources, some 50 candidates have already been trained in public health and sanitary science, and have graduated from the Harvard Technology School in these subjects. In both schools an attempt is being made to educate experts or leaders in sanitary investigation, organisation, and education. The schools are being fully equipped and staffed by a combination of the best organisers and teachers in the country. Professors of pathology, bacteriology, preventive medicine, biochemistry, physiology, engineering, hygiene, and the like are being appointed. Experts are dealing with biometrics and vital statistics; industrial hygiene; practical public health work and laboratory methods; social and mental hygiene; social service work in the people's homes and at the hospital; the nature and prevention of communicable diseases; parasitology and epidemiology; applied hygiene; immunology and serology; the principles of nutrition and the analysis of foods; sanitary engineering and allied subjects. Similar schools are to be founded and developed in San Francisco, New Orleans, and Chicago, and Professor Sedgwick points out that with such a nucleus as already exists there is no reason why a strong public health school of the same type should not be built up in Cambridge.

Propaganda Work.

One thing came out very clearly in Professor Sedgwick's lectures; our American brethren take a much more comprehensive view of the duties of sanitary and hygiene schools than do we in this country. In these schools they have developed a service for the education of the public, and lecturers and teachers are sent out trained to hand on to the public the elements of general and personal hygiene. For example, in connexion with the educational division of the American Commission for the Prevention of Tuberculosis in France, Professor S. M. Gunn (an American of Irish stock) has organised travelling exhibitions and "poster" services inculcating open windows, personal bathing and cleanliness, care of the teeth, and so forth. In their work in France the Commission had been content to popularise and organise knowledge already acquired, much of which was due to the efforts and research of French medical men and scientific investigators, which were second to none in the world. There was, however, in that country a lack of coördination and coöperation of public authorities and of public health education, and it was this education and coördination that the American Commission had attempted to bring about.

As an example of the kind of public health work that is now being initiated and carried on in the United States a Health Bulletin with the motto "The Health of the People the Beginning of Happiness," published by Dr. F. P. Denny, the health officer of Brookline, Massachusetts, a copy of which is sent out to every household in Brookline, was instanced. Professor Sedgwick explained that all manner of common-sense advice is given in this bulletin. The necessity of attention to small details is urged most strongly; the principle causes of death of Brookline residents are given and means of prevention suggested; the "wear and tear" diseases are described. The author advises that "a medical examination every year is the best kind of life assurance." He points out how some of the 65

deaths from pneumonia and influenza could have been prevented. Of cancer he asks: "Can it be cured?" "Tuberculosis," he says, "is preventable"; "Why, then, were there 25 deaths from this disease in Brookline?" "Flies are filthy"; "there are no substitutes for milk and the milk-supply should be the best obtainable"; a record, analyses, and reports on the milk sold in Brookline are given. Were we to publish similar records and reports in this country actions for libel might ensue. "Food hints" are given and specimen "low cost diets" for a family of five, with recipes, are included. Health maxims and aphorisms are quoted, and striking and easily remembered alliterative phrases given: "Flies, food, and fingers"; "Dirt, diarrhœa, and dinner"; "To cure is the cry of the past, to prevent is the need of the future"; "Health is easier kept *than* regained," and so on.

Professor Sedgwick said that the bulletin afforded some indication of the kind of work that had been and is being carried on by officers of health, whether medical men or laymen, in the United States.

In a letter from the State Commissioner of Health of Virginia to Professor Sedgwick Dr. E. G. Williams says:—

> Before the reorganisation of the State Board of Health the appropriation by the Legislature for two years was $8000. Now you will notice from the Budget that the appropriation for the two years is a little short of one million dollars. Typhoid has been reduced from approximately 15,000 cases the first year of our work to 3500 last year. We hope it will not be many years before it will disappear.

Professor Sedgwick said that lectures, illustrated by lantern slides, posters, diagrams, and circulars dealing with public health education, were given all over the States. These showed what and how much could be done. He quoted a lecture on Trudeau's work on consumption, wherein the history of the development of a successful sanatorium was traced, and the methods employed with excellent results were described. It was pointed out in the lecture that, as in other sanatoriums, only by training in useful and carefully regulated work could the patients be interested and encouraged, their moral raised, and the disease checked.

Professor Sedgwick's own work as a teacher in training health officers and in connexion with the Massachusetts State Board of Health, his researches on the protection and purification of water-supplies and the purification of sewage, are amongst the most important carried out in recent years, and his contributions to epidemiology in the tracing and stamping out of endemic and epidemic diseases have been of national value. We are grateful to him for coming to give us of his wide and ripe experience, and to his colleagues for sparing him to us for a part of their University session.

INDUSTRIAL BLINDNESS.

THE returns of the civilian after-care department of the National Institute of the Blind show Lancashire to have 4202 sightless persons as compared with 2593 in Yorkshire. This difference is largely due to the character of the industries carried on in the two counties. Mining and steel industries are both highly dangerous occupations, especially with regard to the eyes of the workers. In spite of the attention given by the local authorities to the prevention of such injuries, it appears that the number of those who have lost their sight from industrial causes has increased during the last ten years. On the other hand, the compulsory notification of ophthalmia neonatorum has resulted in a great diminution of infantile blindness.

PUBLIC HEALTH AT CAPETOWN.

THE population of the city of Capetown was estimated to number 172,050 on Dec. 31st, 1918, no increase having occurred during the previous twelve months, the deaths indeed (7892) having exceeded the births (5482). There has been no complete census enumeration since 1911; the European population was estimated at 89,700 in December, 1917, and this estimate is considered to hold good for the next year. The period for which Dr. A. Jasper Anderson, medical officer of health to the city, presents his report is the twelve months ending June 30th, 1919, which he describes as "undoubtedly the blackest year in the annals of the city with regard to the health of the people. The extremely severe epidemic of influenza in October, 1918, has vitiated all the health statistics, and renders all comparisons with previous years fallacious."

The general birth-rate was 31·86 per 1000, that for Europeans being 24·59, and for non-Europeans 39·76, as compared with 35·44, 27·44 and 44·12, the ratios for 1918. The general death-rate was 45·86, that for Europeans being 26 and for non-Europeans 67·48; when corrected for visitors these ratios become 42·38, 22·78, and 63·74 respectively. The European male death-rate was 25·42, and that for females 20 per 1000. In the month of October the deaths numbered 4588, out of the year's total of 7890; this, when compared with the 245 deaths in October of the year preceding, gives some idea of the influenza visitation. The infant mortality ratio was 224·37 per 1000 births, compared with 152·28 in 1918; for Europeans these ratios were 114·69 and 79·24; October and November were particularly fatal to the new-born infants, 415 dying in these two months out of the total 975 during the year. There was great variation in the different wards of the city as regards this infantile mortality; among European babies 291 per 1000 born died in the Harbour ward (No. 2), but only 42 per 1000 in Kalk Bay (No. 14); while among non-Europeans 397 per 1000 died in Mowbray and 179 in Park ward; this slaughter of the innocents is therefore to a great extent preventable.

Infectious Diseases.

There were 444 cases of *enteric fever*, of which 234 were among Europeans (2·61 per 1000), with 23 deaths; 85 of these cases occurred in Woodstock and Salt River wards, together with 59 among non-Europeans, making a total of 144 cases in these two wards, which have no drainage system and are overcrowded. *Tuberculosis* was notified (or discovered) in 709 fresh cases (of whom 129 were Europeans), compared with 830 (of whom 134 were Europeans) in the previous year; the death-rate for Europeans was 0·84 per 1000 (compared with 0·87 in 1917–18). *Influenza* reached Capetown in September, 1918, and came to an end in the last week of October. It caused 4041 deaths, of which 961 were among the European residents, the death-rate being 10·7 per 1000 for Europeans, 37·4 for natives, and 23·4 for the whole population. Vigorous and successful measures were taken to deal with the epidemic, and inoculation with a polyvalent vaccine was used with good effect. The composition of this vaccine was: *B. influenzæ* (Pfeiffer) 200 millions, streptococci 1000 millions, and pneumococci 800 millions per c.cm., with a dosage of 0·25 c.cm.

Strenuous efforts for the extermination of mosquitoes continue to be carried out on the usual lines, and "many inhabitants have expressed their appreciation of the comfort derived from the diminution of the annoyance caused by this insect." Rat-catching is also carried out systematically, 6079 having been destroyed in the course of the year. It is noteworthy that only 17 cases of measles, and not a single case either of small-pox or of scarlet fever, occurred in Capetown during the two years, July 1st, 1917, to June 30th, 1919.

The report is fully illustrated by tables and diagrams. It might be suggested that the ward-populations be stated, so that the relative incidence of infectious diseases, &c., in various parts of the city might be ascertained. The mere statement of the number of cases or deaths does not show comparative severity of incidence.

FOOD CONTROL IN GERMANY.

A PARAGRAPH appears in the *Economic Review* (Sept. 3rd) which affords an interesting comparison of the food control position in Germany in certain directions with that in this country. It is as follows:—

> An outcry for the release of bread and foodstuffs from Government control is making itself loudly heard. It is stated in the technical organ, *Die Mühle*, that while 25·40 per cent. of the price of 100 kg. of rye goes to the farmer, the Government absorbs 32·60 per cent., mostly in the futile expenses of the official apparatus of control. Bread is now Mk.1 per lb., as against 12 Pfennig before the war, yet the Government operations show a yearly deficit of Mk.4,7 milliards. It is pointed out, however, that a hundredweight of foreign corn costs Mk.500 to 600, and that the present price of bread in Germany is considerably below its value in the world market.

Germany has, no doubt, pushed the policy of subsidising essential foods much on the lines pursued by our Government, and the withdrawal of that policy must, at all events for a time, tend to advance prices. It is to be hoped that the harvests this year will show a good return, and so help to ease the situation.

ANNIVERSARY OF COMMERCIAL AVIATION.

SINCE the Handley Page Pioneer Commercial Air Service was inaugurated a year ago the London to Paris service has been established, so as to necessitate a custom house on the Cricklewood aerodrome. A Royal air mail service from London to Holland was started on July 6th, and another to Belgium on July 19th. In August London was linked up to Berlin, Hamburg, Bremen, Warnemünde, Malmö, Copenhagen and Christiania via Amsterdam. During the period from July 25th to August 31st inclusive 848 passengers were carried on these services. The total number carried from Sept. 2nd, 1919, to August 31st, 1920, inclusive, was 2988, the freight and mails amounted to 149,975 lb., and the distance covered to 213,350 miles. Goods carried ranged from valuable jewellery, samples of goods, to babies' cradles, heavy chemicals, and machinery weighing a quarter of a ton in one piece. Livestock included cats, dogs, fowls, and lobsters. Letters can be sent by air to Paris or Brussels merely by marking them "By Air Mail" in the top left-hand corner and affixing 2*d.* per ounce extra in stamps.

A POISON IN MENSTRUAL BLOOD.

B. Schick, in the *Wiener klinische Wochenschrift*, No. 19, 1920, records that a bunch of roses held for some time in the hand of a menstruating woman drooped and faded within 24 hours. It appears that the injurious effect on cut flowers of contact with this particular woman had been known to others and some experiments were made on the supposed menstrual poison which is designated by the name "menotoxin." The action is not one common to all women during menstruation. The anemone seems specially susceptible to the supposed poison—this flower held in the hand for 10 minutes by the person experimented on faded in four hours, and the effect was most marked during the first 24 hours of menstruation. Even the activities of yeast in dough were said to be affected. The medium of the assumed poison is the sweat. If the flowers were held in the hand encased in an indiarubber glove they were unaffected, nor were they affected by being vigorously breathed on or by the saliva. A swab of the sweat taken from the axilla or palm of the hand placed in a vessel of water containing flowers acted on them in the same way as did contact with the hand. The serum of the menstruating individual was inactive, while the blood-clot was markedly poisonous. Menstrual blood itself has proved to be highly poisonous to flowers and twigs; its poisonous activities were not affected by heating to 56° C., and were only slightly weakened after heating to 100° C.

ANÆSTHETICS IN VETERINARY SURGERY.

IN his presidential address recently delivered at Bristol before the members of the Mid-West and South Wales Veterinary Association Mr. W. M. Scott, F.R.C.V.S., pleaded for organisation in the veterinary profession to attain the objects which all veterinary surgeons desired. The Animals (Anæsthetics) Act, recently added to the statute-book, had lost at the eleventh hour its most important clause—namely, that no anæsthetic should be administered unless by a duly qualified veterinary surgeon. The object of the promoters of the Bill had been to obliterate surgical pain. Could anyone, he asked, imagine anything more incongruous than the empiric, who had had no collegiate training, administering an anæsthetic to produce *complete* anæsthesia? Imagine a human being chloroformed by a barber! The animal might have a whiff of chloroform, but who was going to prove that the operation was painless? Mr. Scott added with regret that the unqualified element which resisted the Bill was a stronger and better organised force than that representing the veterinary profession itself.

DRY CELLS AND BATTERIES.

Messrs. Siemens Brothers and Co., Ltd., of Woolwich and Palace-place-mansions, Kensington Court, W., have just issued a new and enlarged edition of their catalogue of dry cells. The list is a very comprehensive one, the number of types and sizes manufactured at their factories exceeding 600. The applications are, of course, numerous; but amongst the cells described are those adapted for medical work, such as galvanisation, faradisation, ionic-medication, galvano-cautery, exploring lamps, and so forth. The portability of these cells is an obvious advantage in medical practice. The list includes also specifications of "inert" cells, which may be stored, it is claimed, for an indefinite period in any climate without undergoing deterioration. The cell is rendered active by the addition of water. This form of cell offers a clear convenience.

EYESIGHT AND SHOOTING.

THE anxiety of the Germans about the good shooting of their army, their determination that all soldiers should have their errors of refraction corrected by "shooting spectacles," and that breakages, if they occurred, should be immediately replaced are well brought out by Major R. A. Fenton in the *Military Surgeon* (Washington, D.C., U.S.A.) for July. An "optical chest," holding 208 pairs of lenses and 84 empty spectacle frames, was carried by every division and even up into the front line. Men with uncommon defects had a duplicate pair of lenses supplied them before leaving Germany (the prescription was pasted into their pay books), and the medical officers of their units were responsible that these spare glasses were on the men or replaced. German ametropes wore special spectacles inside their gas masks, but Americans wore theirs outside. The German lenses were 38·2 mm. in diameter, the American 40 mm., which made a little awkwardness when the United States army captured German stores and wanted to use the spare lenses found in their own spectacle frames. The lenses were very often meniscl to diminish distortion in the periphery of the field. The loss of useful service of soldiers whose spectacles were broken was considered at headquarters to be so important that replacements in the optical chest were demanded immediately by post and by post issued from headquarters in Germany directly. We have little doubt that our army had no such detailed arrangements for helping ametropes.

STERILISED HORSE SERUM.

THE treatment of anæmia by the internal administration of horse serum has been studied in France. The serum is also a hæmostatic agent applicable in external and internal hæmorrhage. Dr. Émile Weil has lately mentioned it in this connexion (THE LANCET, August 7th, p. 300). Hémostyl (L. Preud'Homme, 21, Rue d'Aumale, Paris) appears in three forms: (1) fluid in ampoules; (2) syrup; and (3) tablets. Samples have recently been submitted to us. It is stated that hémostyl is collected from young and healthy animals frequently bled, each drawing being carried out at a time when the horse is at the maximum point of blood regeneration. The treatment is based on the idea of "la rénovation sanguine." There is an extensive bibliography on the subject, published in Paris, Lille, Montpellier, Bordeaux, and elsewhere, and a paper by P. Carnot is quoted entitled, "Thérapeutique des syndromes hémorragiques" (Rapport au XIIIe Congrès français de Médecine, Octobre, 1912). The use of horse serum in sepsis is referred to also in an annotation in THE LANCET of June 12th, 1920, p. 1279. Samples of hémostyl may be obtained from Messrs. Wilcox, Jozeau, and Co., 49, Haymarket, London, S.W.1.

ROYAL EARLSWOOD INSTITUTION FOR MENTAL DEFECTIVES.

WE congratulate the board of management of this benevolent institution on its relief from financial embarrassment owing to a bounteous bequest from an old supporter, which will enable the clearing off of a bank overdraft amounting to £20,000, "contracted largely owing to the conditions prevailing during the great war," as well as the carrying out of much-needed improvements delayed through lack of funds. The seventy-third annual report of the institution, from which we take this gratifying information, shows that over 4000 cases have participated in the benefits of the establishment since its foundation in 1847, benefits not confined to the inmates themselves, but affording incalculable relief to families burdened with a mentally afflicted member. Earlswood has all along ministered to the needs of various social ranks and conditions, and now that public provision by local authorities and the State is to be made more largely under the Mental Deficiency Act the board of management contemplates an extension of the scope of usefulness of the institution to the needs of the professional and middle classes, impoverished as they are by present financial conditions, so as to entitle them to consideration in the scheme of charitable aid for mental defectives. Experience has shown that in the majority of cases permanent supervision is desirable, and the fact that more than half of the inmates of Earlswood are now over 20 years of age, and that 72 were on Dec. 31st, 1919, 45 years and upwards (three being over 75), shows that this desideratum has not been overlooked, though still capable of extension. At the same time, in order to secure the best results from training early admission is essential, and the proportion of those admitted last year under 14 years of age was 65 per cent., amongst them three infants under 5. From the report of the medical superintendent (Dr. Charles Caldecott) for 1919 we glean the following particulars. The aggregate of cases under care during the year numbered 522 (339 males, 183 females), and the average number in residence 446 (280 males, 166 females). Of 67 cases admitted, 11 were classed as idiots, 50 as imbeciles, 1 feeble-minded, and 1 moral imbecile. Eight were "Mongolians," 2 hydrocephalic, 9 epileptic, and 10 paralytic. Of 37 patients discharged, 30 were notified as "improved." Fifty deaths occurred during the year, 15 attributed to influenza, 13 to various forms of tuberculosis, and 4 to senility (the oldest aged 76). Post-mortem examinations were made in 34 cases. The death-rate, equivalent to 11·2 per cent. on the average number resident, is more than double that occurring in pre-war times, and Dr. Caldecott states that during the last three years there have been severe epidemics and unusual debility due, he thinks, to unfavourable war conditions, such as restrictions of diet and interference with normal lighting and ventilating arrangements necessitated by D.O.R.A. regulations. He considers, however, that, in view of the proportion of inmates normally requiring hospital care being at least 25 per cent., infirmary additions are called for, and he suggests balconies for open-air treatment.

The report contains interesting details as to the instruction of the patients, both at school and in a variety of useful indoor and outdoor industries. In such an institution there must needs be also much of medical interest, and we are glad to find that facilities for the clinical study of mental deficiency are afforded to students of metropolitan hospitals and post-graduate classes.

Dr. G. K. Audrey has been appointed chief assistant medical superintendent to the institution.

THE offices of the Director-General of Medical Services, Ministry of Pensions, have been transferred to the Crown Agents' Annexe, 5, Millbank, Westminster, London, S.W.1.